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ABSTRACT

The third in a series of studies to assess the reading achievement of Indiana students, a study compared the reading achievement of sixth and tenth graders in 1944-45, 1976, and 1986. The same edition of the Iowa Silent Reading Test (ISRT) was administered to sixth- and tenth-graders in 1944-45, 1976, and 1986. The 1944-45 sample consisted of 25% of the students throughout the state, and was neither random nor stratified. The 1976 and 1986 samples were stratified and randomly chosen to represent the entire population of sixth and tenth graders in the state. For all three testing periods additional information about the teaching of reading, the organization of schools, and the students and their communities were collected. In 1986 a newer and more recently normed test, the Metropolitan Achievement Test (MAT), was administered to a subsample of the ISRT test takers to provide a means to compare ISRT test takers to recent national norm performance. Results revealed that the 1986 sample far outscored their earlier counterparts on every subtest and on Total Median Score. Unadjusted percentile averages for the Indiana tenth graders showed an advantage for the 1944-1945 sample. An adjustment for a 17-month age difference in 1986, however, indicated little change in reading performance over the four decades. The results of this study are presented in the context of the educational and societal conditions of each time period. (Thirty-four figures and 26 tables of data are included, and administrator and teacher questionnaires, and 33 references are appended.) (MM)

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THEN and NOW

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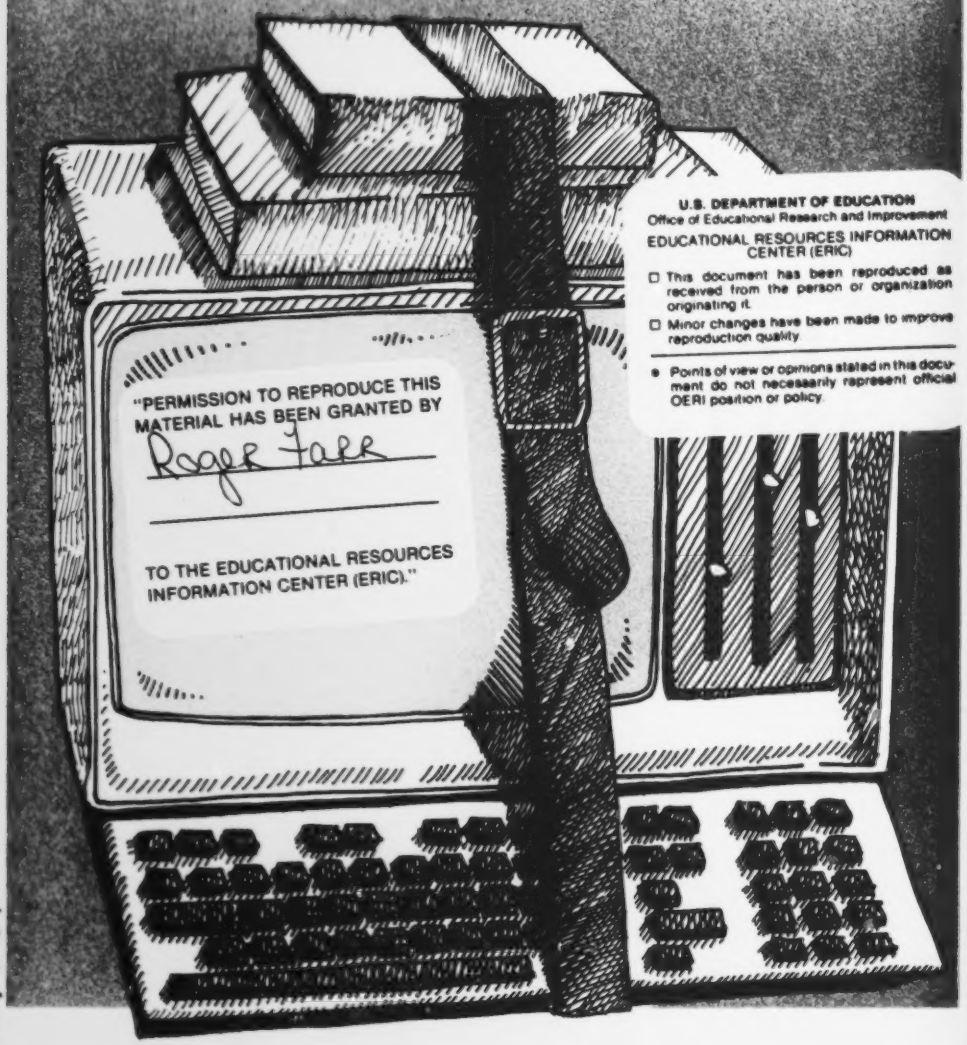
1944-45, 1976 and 1986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INDIANA UNIVERSITY

THEN AND NOW

READING ACHIEVEMENT IN INDIANA

1944-45, 1976, and 1986

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1987

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Roger Farr
Leo Fay
Jamie Myers
Michael Ginsberg

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CHAPTER 1
INTRODUCTION

This study is the third in a series of studies to assess the reading achievement of Indiana sixth and tenth graders. The testing of students took place in 1944-45, 1976, and 1986. The same test was used at all three testing periods. The results of the study are presented in the context of the educational and societal conditions of each time period.

Policies regarding the education of children must be based on the best available evidence regarding their achievement. No information is more important than whether academic achievement is improving or declining. While totally valid longitudinal studies are difficult to achieve, we are able to provide reasonable estimates of changes in achievement over time.

The Need for Scientific Comparisons

Much of what the public reads about today's schools draws loose comparisons of the achievement of contemporary students to those educated in past years. Few of such comparisons are based on broadly collected or carefully controlled data; and few make any attempt to examine the societal or educational contexts that help in understanding the performance of children. Many comparisons that gain public attention are very general appeals to intuitive evaluation; they evoke either allegiance to yesterday's methods, materials, and classrooms or a defense of what is happening in today's schools. Unscientific comparison serves critics with a broad spectrum of motivations that range from a concern for the improvement of education to the desire to effect political change. Obviously, the critics whose interest centers on improving our schools must be wary of quick, careless comparison and should seek direction from studies that attempt to be as well controlled as possible. Such studies need to be prefaced by the understanding that it is difficult to compare the achievement of today's children to that of children of former years.

A major reason that adequate comparisons have not been made is that they are difficult to effect. When data from previous years are available, the details that describe their collection, the schools that participated, and educational and societal factors that may have acted as significant variables on the specific sample are not always available. The school settings from which the samples are drawn can change for many reasons: populations shift, communities develop or dwindle, schools consolidate, emphases in teacher training change, and age levels within grades change markedly.

Nor does measurement remain constant. The measurement instrument used in one era may have become unavailable, and if made available, may include content that was more appropriate to earlier generations than to present day students. Thus, if the testing instrument remains constant, its appropriateness for the populations compared must be considered. If it does not remain constant, there are other problems. Instruments that measure development and achievement change to reflect shifting social values and new curricula. Thus, when scores from a contemporary instrument are laid beside those from a test of another era, the content of the tests themselves must be considered as a vital factor in any differences noted.

One must compare the achievement of today's children to that of the past with a caution that considers as many of these variables as possible. Such concerns make achievement comparisons over periods of time a very complicated and imprecise business; but any responsible attempt to evaluate today's schools by comparison with an earlier period should examine them. The caveats related to conducting and interpreting then-and-now research will be discussed later in the chapter. Actually, several approaches to over-time comparisons have been undertaken, including the traditional then-and-now studies, the renorming of tests, the periodic assessments conducted by the National Assessment of Education Progress (NAEP), and studies of adult literacy. Each type of study adds to the mosaic of the changing nature of literacy in our society.

Then-And-Now Studies

Several summaries of then-and-now studies have been published. Farr, Tuinman, and Rowls (1974) summarized studies comparing reading achieve-

ment with time spans ranging from 1840 to the early 70's. They also contacted 27 of the nation's largest metropolitan school districts and 73 smaller districts to collect trend data. Data was collected from 12 (5 large, 7 small) of the 100 districts contacted.

Farr and Fay (1982) summarized reading trend data in the United States which included, in addition to previously reported data, information from a number of state testing programs, as well as the 1976 Indiana Then and Now Study.

Stedman and Kaestle (1987) reviewed the status of literacy and reading performance over the last century.

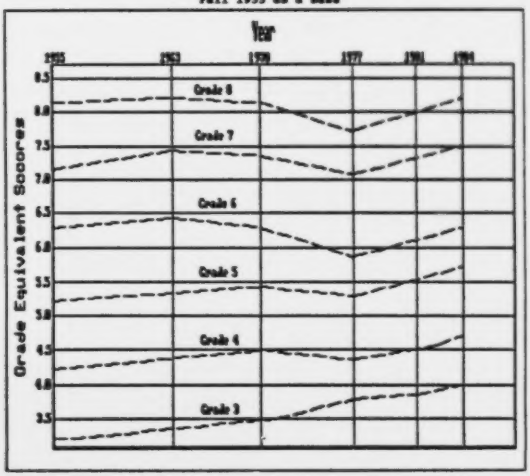
These three summaries provide a comprehensive review and analysis of studies covering a wide range of time periods, grade levels, and communities. Direct comparisons across these studies are virtually impossible. Hence, no conclusions are justified on a national basis, other than to suggest that achievement remained generally constant in spite of marked changes in schooling and demographics. If corrections are made to account for the younger age at a given grade level, students in recent years consistently scored higher than students of the same age in the past. There is no evidence of a golden period in the past when students generally read better than they do today. While these generalizations may be questionable for national trends, then-and-now studies are of value for specific well-defined populations.

Renorming Studies

Analyzing changes in performance reflected in changes in the norms of tests is another approach to reviewing achievement trends. A.N. Hieronymus (1986) reported such changes across editions of the Iowa Test of Basic Skills for grades 3-8 for the period from 1955 to 1984 in the following figure:[1]

Figure 1

Summary of Composite Achievement Trends 1955-1984, Grades 1-8, Using Median Performance of Fall 1955 as a Base



[1] From an unpublished paper Iowa Tests of Basic Skills (1977-8 vs 1984-5 Norm Comparisons), A.N. Hieronymus, University of Iowa, 1986.

It is to be noted that, in general, performance improved between 1955 and 1963, leveled off between 1963 and 1970 with losses in some grades and improvements in others, and declined substantially between 1970 and 1977 in all grades except 2 and 3. Between 1977-78 and 1984-85 achievement improved substantially in all grades.

The general pattern of a substantial drop in test scores from the late 1960's through the late 1970's for grades five and higher as portrayed in Figure 1 was found generally across achievement tests. Why this drop occurred or if it is, in fact, "real" has not been determined. Many educators point to changing demographics, and critics severely criticize the schools, the curriculum, general permissiveness and lack of discipline in the schools, social upheaval, changes in family structures, and even the nuclear tests of the 50's and early 60's as possible causes.

Rock (1987) studied the phenomenon of test score declines on the basis of two competing hypotheses about potential causes of the score decline among high school seniors during the 1970's. The first hypothesis argued that the primary reason for the changes in student demographics with an increased representation of minority group members, many of whom were traditionally low achieving students was the primary reason for the observed score declines. The second hypothesis related declines to changes in student behavior and school processes. Rock found that the score declines were primarily due to changes in student attitudes and school processes and only minimally due to changes in school populations.

At this time, perhaps the most important observation is that whatever happened has been largely corrected or compensated for and that test scores, at least through grade 8, have fully recovered and are now at the highest level of at least the last thirty-plus years.

The National Assessment of Educational Progress (NAEP)

The four national assessments of reading performance of 9-, 13-, and 17-year-olds conducted in 1971, 1975, 1980, and 1984 provide another base for understanding trends in reading performance. In their report, *The Reading Report Card* (1985), NAEP summarizes the results of their assessments. The report focuses on trends over this 13-year period for broad student samples and for various subgroups. Background data was also gathered to consider the relationships between reading achievement and such factors as TV viewing, amount of homework, the amount of reading material in the home, and the education level of parents.

NAEP summarizes its findings as follows: (pp. 67)

Recent achievements.

—Students at ages 9, 13, and 17 were better readers in 1984 than students at the same ages in 1971. Nine and 13-year-olds improved through the 1970's, and 17-year-olds improved between 1980 and 1984. This improvement may in part reflect earlier achievements in ages 9 and 13.

—Black and Hispanic students, as well as those living in disadvantaged communities, have made improvement.

—Virtually all 13- and 17-year-old students can read *basic* material.

—84% of the 17-year-olds in school have acquired the *intermediate* reading skills necessary to read relatively lengthy reading passages.[2]

Figure 2

LEVELS OF READING PROFICIENCY
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

Rudimentary

Readers who have acquired rudimentary reading skills and strategies can follow brief written directions. They can also select words, phrases, or sentences to describe a simple picture and can interpret simple written clues to identify a common object. Performance at this level suggests the ability to carry out simple, discrete reading tasks.

Basic

Readers who have learned basic comprehension skills and strategies can locate and identify facts from simple informational paragraphs, stories, and news articles. In addition, they can combine ideas and make inferences based on short, uncomplicated passages. Performance at this level suggests the ability to understand specific or sequentially related information.

Intermediate

Readers with the ability to use intermediate skills and strategies can search for, locate, and organize the information they find in relatively lengthy passages and can recognize paraphrases of what they have read. They can also make inferences and reach generalizations about main ideas and author's purpose from passages dealing with literature, science, and social studies. Performance at this level suggests the ability to search for specific information, interrelate ideas, and make generalizations.

Adept

Readers with adept reading comprehension skills and strategies can understand complicated literary and informational passages, including material about topics they study at school. They can also analyze and integrate less familiar material and provide reactions to and explanations of the text as a whole. Performance at this level suggests the ability to find, understand, summarize, and explain relatively complicated information.

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[2] Figure 2 provides NAEP's definitions of levels of proficiency. Carroll (1987) suggests grade level equivalents for the NAEP levels as follows: Rudimentary (1.5), Basic (3.6), Intermediate (7.2), Adept (12.9), Advanced (16.0).

Advanced

Readers who use advanced reading skills and strategies can extend and restructure the ideas presented in specialized and complex texts. Examples include scientific materials, literacy essays, historical documents, and materials similar to those found in professional and technical working environments. They are also able to understand the links between ideas even when those links are not explicitly stated and to make appropriate generalizations even when the texts lack clear introductions or explanations. Performance at this level suggests the ability to synthesize and learn from specialized reading materials. (p. 15)

Areas of concern.

—Nine- and 13-year-olds did not show improvements between 1980 and 1984 ending the upward trend of the 1970's.

—The marked improvements in the achievement of minority and disadvantaged students between 1971 and 1984 have reduced the gap between their performance and that of other students. Still, the average performance of these students is in need of further improvement.

—Six percent of 9-year-olds in 1984 could not complete *rudimentary* reading exercises and are in danger of school failure. Forty percent of 13-year-olds and 16% of 17-year-olds attending high school do not function at the *intermediate* levels and would likely be unsuccessful in reading the range of academic material encountered in school. Only about five percent of students, even at age 17, have advanced reading skills and strategies.

Other NAEP Trends.

—The influence of the home environment is apparent. At all three ages, students from homes with abundant reading materials are substantially better readers than those who have few materials available. Students whose parents have a post-high school education read substantially better than those whose parents have not graduated from high school.

—Six or more hours of daily TV viewing is strongly related to lower reading proficiency for all three age groups.

—In general students who receive and do homework assignments read better than those who do not.

The NAEP results reinforce the conclusion that reading performance has generally improved. They also highlight areas of concern, e.g., that 9- and 13-year-olds' performance has remained static over the last two testing periods and that the performance of minority and disadvantaged students, although improved, needs continued attention. The NAEP study adds a significant dimension to understanding differential patterns of achievement, by examining contextual factors largely outside of the control of the school that relate to reading performance.

Adult Literacy Studies

Programs to overcome adult illiteracy have emerged as a top priority in our society. Unfortunately, much confusion exists as to what the problem really is and what needs to be done. Cook's (1977) history of the development of literacy in our society and the Ford Foundation report, *Adult Illiteracy in the United States* (1979), show that the nation has become increasingly literate. At the same time, functional literacy demands have increased over time and a host of social and political problems continue to hamper attempts to assist the large number of people who find themselves handicapped by inadequate literacy skills. In his review, *The Status of Literacy in our Society*, Mikulecky (1986) concludes:

> We have more than one literacy "problem" in the United States. The problem receiving the most media attention is the painful problem of the small percentage of adults who can barely read or write. A much larger and different problem relates to the millions of adults who can read and write, but not well enough to meet the increasing literacy demands for attaining a comfortable living in the United States. Confusion of these two aspects of literacy problems and the fact that these problems need to be addressed using different methods has led to a number of embarrassing misunderstandings including a national advertisement falsely claiming that by the year 2000, two out of three Americans may be illiterate.(p. 37-38)

The recently completed NAEP study of literacy among young adults ages 21-25 is the most sophisticated study of adult literacy ever conducted in this country. In their report *Literacy: Profiles of America's Young Adults*, (1986), Kirsch and Jungeblut observe that "Although some of our citizens reach adulthood unable to read and write, we are a better educated and more literate society than at any time in our history" (p.63). The effect of changing standards over time is revealing. Virtually all young adults meet the standards of 100 years ago of being able to read and write their own name. About 95% reach or surpass the fourth-grade standard set by the military in the 1940's. Compared to in-school students, more than 80% of young adults read as well as or better than the average eighth grader and more than 60% equal or surpass the average eleventh grade-student.

Whether such standards will continue to be applicable, given the varied literacy demands of our society, is questionable. Reflecting this thought, the report's final paragraph suggests that obtaining and maintaining literacy is a never-ending goal—

> As one final point, becoming fully literate in a technologically advanced society is a lifelong pursuit, as is sustaining good health. Both are complex and depend upon a number of factors. So, just as there is no single action or step, that if taken, will ensure the physical health of every individual, there is no single action or step, that if taken, will ensure that every individual will become fully literate. (p. 67)

In conclusion, all four types of studies reviewed, then-and-now studies of reading achievement, test renorming studies, the studies of the National Assessment of Educational Progress, and research in the area of adult literacy, show that literacy development has progressed steadily over time and that we are a more literate nation today than at any time in our history. The evidence

is also clear that the literacy record is an uneven one. Much remains to be done if the nation is to successfully meet the ever increasing literacy demands of our society.

Caveats Regarding Then-and-Now Studies

The literature also identified a number of cautions or problems related to conducting and interpreting then-and-now investigations. Farr and Fay (1982) and Stedman and Kaestle (1987) discussed the major weaknesses. In the following discussion several major problems are identified and the manner in which each is treated in the current study is summarized.

Comparability

It is contended that then-and-now studies lack comparability. In their review, Stedman and Kaestle report that with only two exceptions, matching of populations studied over time was not attempted. Changes in educational policies, mainstreaming, changes in graduation rates, and several other factors related to the context of schooling and society were either ignored or discussed superficially. This is a valid criticism. Then-and-now studies typically were not preplanned as such and, consequently, at best could only try to construct the context of the earlier period.

In the 1944-45/1976 Indiana study, context data was collected for the 1976 period and a companion study by Blomenberg (1980) attempted to reconstruct the context of schooling and society for the 1944-1945 period through document and textbook analysis and through extensive interviewing of people who taught at that time. In this 1986 Indiana study, context data comparable to 1976 and 1944-45 was gathered and reported. In addition, a carefully constructed stratified sampling procedure was used in 1976 and 1986 to attempt to insure that the sample represented the broad spectrum of Indiana students.

Generalizability

It is asserted that then-and-now studies are not nationally representative. Studies range from a population of one school to very limited national samples. The number of studies is too small and too geographically scattered to represent a national sample and hence it is not appropriate to suggest national trends on the basis of only these studies. While this may be a valid conclusion in itself, nevertheless, the evidence from then-and-now studies may be added to the findings of other studies to suggest conclusions concerning national trends. Furthermore, this criticism does not detract from the value of then-and-now studies for gaining insights concerning trends in reading achievement for a given carefully defined population.

What's Being Tested

Stedman and Kaestle (1987) observe that then-and-now studies measure areas well beyond reading comprehension which would make comparisons across studies difficult. They point out that the Indiana study included a speed reading test and items on a comprehension test that depend upon prior knowledge and value judgments. Knowledge and values are subject to change over time and tests that depend upon such factors may be suspect.

To determine the possible effect of bias on performance in the Indiana study, item analysis and interviews with curriculum experts, teachers and students were conducted along with the 1986 testing. The findings from these studies do not show that biased test items are a major problem. The 1986 study also included the administration of the 1985 edition of the *Metropolitan Reading Test* to a sample of Indiana sixth- and tenth-grade students. This more modern test provides an anchor for future studies that will alleviate test item bias.

Age Versus Grade Comparisons

Farr and Fay (1982), as well as Stedman and Kaestle (1987), perceive reporting results by grade score as a major problem of then-and-now studies. They believe age scores to be more valid indicators of a student's reading performance. The Indiana study presented results by both grade and age scores for grade six and by percentile scores for grade ten.

Because the 1976 sixth-grade students were ten months younger and the tenth-grade students were fourteen months younger than the 1945 students, 10 and 14 months were added to the students' scores. Stedman and Kaestle suggest that this was an over-correction which probably led to an over estimate of 1976 performance. Actually the data was presented in both uncorrected and corrected forms. In terms of performance at grade level status there was no difference in performance between the 1945 and 1976 students. The marked difference in age, however, cannot be ignored and suggests that the 1976 students performed better than their 1944-45 counterparts. We would agree that age scores are preferable from a technical point of view; however, this 1986 report will continue to use age differences and percentile scores, reporting results in both uncorrected and corrected forms. The difference in age has increased from 1945 to 1986 and again merits consideration in interpreting the data.

The Indiana Then-and-Now studies provide a data base for interpreting trends in reading achievement gathered in a controlled and systematic manner, together with an awareness of and concern for the recognized problem connected to such studies. It must be recognized that continuous change takes place over time. There is no way to make absolute comparability possible. Therefore, conclusions based upon then-and-now studies should be approached cautiously, and, whenever possible, reinforced with findings from other types of investigations.

CHAPTER 2

METHODOLOGY

The primary methodology was the administration of the same edition of the *Iowa Silent Reading Test* to sixth- and tenth-grade students in 1944-45, 1976, and 1986. The 1944-1945 sample consisted of 25% of the students throughout the state. The 1944-1945 sample was neither random nor stratified. The 1976 and 1986 samples were stratified and randomly chosen to represent the entire population of sixth and tenth graders in the state.

For all three testing periods additional information about the teaching of reading, the organization of schools, and the organization of the school year were collected. Demographic data was not reported in the 1944-1945 study, but retrospective data regarding the 1944-1945 time period was collected in 1976. Demographic data collection was an integral part of the 1976 and 1986 studies.

Finally, in 1986 a newer and more recently normed test, the *Metropolitan Achievement Test*, was administered to a subsample of the ISRT test takers. This newer test provided a means to make comparisons of the ISRT test takers to recent national norm performance.

General Procedures Used in 1944-1945, 1976 and 1986

In replicating the 1944-1945 and the 1976 study, the 1986 study administered the same edition of the *Iowa Silent Reading Tests* (ISRT) used in both of the earlier assessments. For the 1986 study, the ISRT was changed slightly in that a new answer sheet was developed to take advantage of advanced test scoring technology. In addition, the 1986 study added a recently normed test, *The Metropolitan Achievement Tests: Reading* (MAT) to the study so that comparisons could be made between students' performance on the older test with their performance on a more recently developed test. Additionally, the use of the MAT provided a comparison with recent national norm performance of sixth- and tenth-grade students.

In both the 1976 and the 1986 studies, additional information was sought through the use of two accompanying questionnaires, one for teachers and one for administrators. Separate teacher questionnaires for sixth and tenth grade included reactions to the test and details about the teaching of reading. The school administrator questionnaire was used to collect basic demographic data about the school organization.

The 1986 sample included a stratified random sample of 13% of Indiana's sixth graders and 10% of the tenth graders. Both the 1976 and the 1986 samples were based on a random selection plan so the sample populations adequately represented the entire state. It was felt that a stratified random sample was the most valid way to select a population that would be comparable with the 1944-45 study which tested 25% of the total state population of sixth and tenth graders.

For all three studies personnel from the Indiana Department of Education and the School of Education of Indiana University worked together to plan and conduct the study. The close cooperation of personnel from the Department, the University, and the participating schools was necessary to administer the ISRT and the MAT to large, state-wide samples and to collect survey data on the communities and schools in the studies. In addition, for both the 1976 and the 1986 studies, measurement specialists from The Psychological Corporation assisted with the design of the study and the scoring and analysis of the test results.[3]

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[3] Information concerning the 1944-45 and 1976 testing is drawn from the following reports:

Smith, Henry Lester, and Eaton, Merrill T. *Analysis of the proficiency in silent reading of 15,206 sixth grade pupils in 648 schools in Indiana. Bulletin of the School of Education Indiana University*, November 1945, *21(6)*. Published by the Bureau of Cooperative Research and Field Service, Indiana University.

Smith, Henry Lester and Eaton, Merrill T. *Analysis of the proficiency in silent reading of 11,424 sophomore pupils in 243 high schools in Indiana. Bulletin of the School of Education Indiana University*, January 1945, *22(1)*. Published by the Bureau of Cooperative Research and Field Service, Indiana University.

Farr, Roger, Fay, Leo, and Negley, Harold. *Then and now: reading achievement in Indiana (1944-45 and 1976)*. Published by the School of Education Indiana University, 1978.

1944-1945 Testing Procedures

For the 1944-1945 study, the State Superintendent of Public Instruction appointed a state testing committee of representative school people. This committee, the State Department of Public Instruction, and representatives of the Indiana University School of Education planned the study. A major aim of the 1944-1945 testing was to provide educators with "reliable information . . . of the level of ability of each pupil in the various skills comprising silent reading. . . ." *The Iowa Silent Reading Tests* (Revised): Form BM was the instrument selected—the Elementary Test (1939) for the sixth grade and the Advanced Test (1939) for the tenth grade.

The State Department of Public Instruction notified all school districts in the State, and participation was encouraged but optional. The State Department of Public Instruction initiated and guided the program. The University distributed instructions for administration of the tests, and personnel from the participating schools assumed full responsibility for the administration of the tests. The tests were scored by the school personnel in each participating school—some by hand and some by machine.

Sixth graders were tested over a 6-month period of the 1944-1945 school year. Summary, analysis, and interpretation of the data was done at Indiana University. Grade/month norms for the date the test was administered were determined. The tenth graders were tested "during the first semester of the school year 1944-1945." No more specific time period is given in the report of the study.

1976 Testing Procedures

To create comparable data for the 1976 study, Indiana University personnel arranged with the Psychological Corporation for the reprinting of the instrument (test booklets and answer sheets) used in 1944-1945. (See description of instrument below.) The Division of Reading Effectiveness of the Indiana State Department of Public Instruction introduced and described the study to the school systems selected for the sample. The few corporations and schools which declined to participate were replaced with comparable substitutes to balance the random sample.

Indiana Department of Public Instruction personnel handled all liaison with the schools. As in 1944-1945, the school personnel administered the tests. The sixth-grade test was administered by the classroom teacher and the tenth-grade test by the homeroom or English teacher. The testing was done during the third week of November, 1976. Unlike the 1944-1945 administration, when the tests were scored by the school personnel, test score sheets were forwarded to the University for machine scoring, compiling, and analysis.

1986 Testing Procedures

For the 1986 study, arrangements were again made with the Psychological Corporation for the reprinting of the instrument used in both 1944-1945 and 1976. In order to expedite the scoring and analysis of the tests a new answer document was developed. It was essential that the new answer sheet be developed since the original answer document could only be scored on machines which were not available in 1986.[4]

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[4] The possible biasing effect of the use of this new answer sheet is discussed in Chapter 5.

In addition to the administration of the ISRT, a recently normed test, the *Metropolitan Achievement Test: Reading* (1986) was administered to a sample of sixth and tenth graders who had also been administered the ISRT. Thirteen sixth-grade schools with 1,010 students and five tenth-grade schools with 931 students were administered both the ISRT and the MAT. These sample sizes represented approximately 1.4% and 1.1% of the state's total sixth- and tenth-grade population. The *Intermediate Level* of the MAT was administered to sixth-grade students and the *Advance-2 Level* of the test was administered to tenth-grade students.

As with the 1976 study, Indiana Department of Education staff members introduced and described the study to the school systems selected for the sample. The few corporations and schools which declined to participate were replaced with comparable substitutes to balance the random sample. Seven sixth-grade and three tenth-grade schools in the final sample did not complete the testing.

Indiana University staff and staff from the Indiana Department of Education handled all liaison with the schools. As in 1944-1945 and 1976, the school personnel administered the tests. The sixth-grade test was administered by the classroom teacher and the tenth-grade test by the homeroom or English teacher. All testing was completed during October 1986. Unlike the 1944-1945 administration, when the tests were scored by the school personnel, and the 1976 administration when the tests were forwarded to the University for machine scoring, the 1986 tests were sent to The Psychological Corporation in San Antonio, Texas where all scoring and data analysis was completed.

Questionnaire Surveys

In the 1944-1945 study, school personnel were asked to fill out a special form prepared by the University to ascertain data about the pupils, the school, and methods and aspects of teaching reading. The sixth-grade survey asked for length of the school term, number of classrooms in the building, number of grades in the room, number of minutes given each day and each week to the study of reading, class and school enrollment, and whether reading was taught as a separate subject or in connection with another subject or both. The 1944-1945 tenth-grade study reported on only school enrollment and length of school year.

For both the 1976 and the 1986 studies, a questionnaire based on the form used in the 1944-1945 sixth-grade study, but also seeking additional information, was sent to all participating school personnel. It sought to ascertain the following: the type of community served by the school, the type of organization (grade breakdown) of the schools in the system, average class size, length of school year, class size (total for grade level), classes included in school, teacher training and experience in years, number of rooms in building (elementary), grouping within classroom (elementary), whether reading was taught with other subjects, information about the school's reading instructional program, information about the type of students taught and the community, and teacher reactions to the *Iowa Silent Reading Tests*.

Description of the Instruments

The *Iowa Silent Reading Tests* have been broadly used in the United States since their development to measure achievement in silent reading. The special printing of the ISRT—Elementary and Advanced—for the 1976 and 1986 studies were the thirty-second and twenty-fifth editions, respectively. Thus the 1976 and 1986 sixth and tenth graders took the exact tests given in 1944-1945. The *Metropolitan Achievement Tests: Reading* were also administered to a representative sample of the 1986 sixth and tenth graders who took the ISRT. The MAT is a widely used school achievement test battery. The latest edition of the MAT was normed during the 1984-85 school year.

The Iowa Silent Reading Tests-Elementary

The *Iowa Silent Reading Tests (New Edition)-Elementary Test*: Form BM (Revised) (Greene and Kelley, 1939) was used to test the sixth graders. It was developed to assess the silent reading ability of students in grades four through eight. The test emphasizes comprehension in silent reading. The 1943 manual stresses this point: "A few years ago it was enough for the child glibly to *pronounce* words appearing on the printed page. Now it is considered much more important for him to be able to comprehend rapidly and indicate by specific reactions his understanding of the materials."[5]

The test is made up of a total of eight subtests plus a total score. These are 1) Rate, 2) Comprehension, 3) Directed Reading, 4) Word Meaning, 5) Paragraph Comprehension, 6) Sentence Meaning, 7) Alphabetizing, 8) Use of Index, and Total Median Score.

1. Rate. This test is the number of words in text a student can read in two minutes. The student reads a story for one minute, and the examiner then calls time and the examinee circles the word that was being read when time was called. The same procedure is followed for a second story. The *rate* score is the total number of words read in two minutes. No *comprehension* is measured on the *Rate* test.

2. Comprehension. This test is made up of 10 questions following each of the two passages in the Rate test. After the examinees have read for one minute, they are given an additional two minutes to answer the 10 questions; thus examinees are given two minutes to answer each set of 10 questions. They *may not* look back at the passage when they are answering the questions. This test might better be called a "rate of comprehension" test, for it is so dependent on speed. It is a test in which the comprehension is at a constant level of difficulty and hence is not a "power of comprehension" test.

3. Directed Reading. This test is made up of two passages, each passage accompanied by 20 questions. The examinee is instructed to *locate* the sentence in the passage which answers the question. The answer is chosen from four numbers corresponding to sentences in the passage. The first passage is 27 sentences long, and the second is 35 sentences long.

The test is timed; examinees are given five minutes to complete each passage. Both passages are textbook-type selections. The first deals with "Slate": how it was formed, how it is quarried, how it is used. The second deals with

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[5] *Iowa Silent Reading Tests*: New Edition: Elementary Test, Manual of Directions, 1943, p. 3.

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"Life in a Castle in Olden Times." The article describes the castle, the people who lived and worked in it, and a little about the feudal system.

4. Word Meaning. The test is made up of 55 items. Examinees are to chose from among four choices the word that means approximately the same as the stimulus word. Examinees are given nine minutes to complete the test.

5. Paragraph Comprehension. This test is made up of 10 short paragraphs (about 75 to 100 words each). Each paragraph is followed by three multiple-choice comprehension questions. Each question has three choices. Examinees are given seven minutes to complete the test. The passages deal with the kinds of topics that are frequently found in textbooks, such as "swordfish," "silk," "corn crops," and "ducks."

6. Sentence Meaning. This test is made up of 27 questions which the examinee must answer either "yes" or "no." Some of the questions seem to assess the student's knowledge of specific facts rather than reading comprehension while others seem to call on the students to make value judgments. The following are examples:

- Is the Fourth of July a national holiday?
- Is it necessary for the President of the United States to be a citizen?
- Is treason to one's country punishable by death?
- Does a witness always tell the truth?

Examinees have three minutes to complete the test.

7. Alphabetizing. This test is made up of 20 words and 30 pairs of guide words such as those found at the top of a page in a dictionary. Examinees are required to match each word with the pair of guide words that would appear at the top of the page on which the stimulus word would be listed. Examinees have four minutes to complete the test.

8. Use of an Index. This test is made up of several entries in an index such as might be found in a social studies textbook. Also included are 18 five-option multiple choice questions which necessitate the use of the index. Examinees are given a total of six minutes to answer the 20 questions.

Total Median Score. The raw scores for the subtests are converted into standard scores, and the median standard score for the eight subtests is the Total Median Score. It is used as a measure of average silent reading ability.

ISRT—Elementary: Evidence of Reliability. The *Manual of Directions: Iowa Silent Reading Test*—Elementary (1943) provides evidence of reliability for both split-half and Kuder-Richardson analyses. The split-half reliabilities are based on a study conducted with 220 Concord, New Hampshire sixth-grade students and the Kuder-Richardson reliabilities are based on the total national standardization sample from 1942. The subtest reliabilities from the split-half analyses with the Concord, New Hampshire sixth graders range from a low of .60 for the Sentence Meaning subtest to a high of .94 for the Alphabetizing test. The reported reliability for the Total Median Standard Score is .93. The subtest reliabilities from the 1942 standardization range from a low of .65 for the Paragraph Comprehension subtest to a high of .91 for the Alphabetizing test. The reported reliability for the Total Median Standard Score is .95.

ISRT—Elementary: Evidence of Validity. The manual discusses the validity of the test in terms of whether the test matches the variety of silent reading situations that a reader faces. It is suggested that this can be judged by a panel of experienced teachers and other qualified experts. While such an approach

to validity is reasonable, the manual provides no description as to how these judgments were secured nor how they might have been used to plan and construct the ISRT.

In addition to the face validity approach taken above, the manual reports that the inclusion of the various subtests should be based on the relatively high contribution of each subtest to the total test score and the low correlation of each of the tests with each other. These intercorrelations are reported in the test manual and support the conclusion that the subtests are relatively uncorrelated (range from .18 to .65) and that each contributes significantly to the total score (range of subtest correlations with the total score from .46 to .83).

The Iowa Silent Reading Tests—Advanced Test

The *Iowa Silent Reading Test New Edition—Advanced Test*: Form BM (Revised) (Greene, Jorgensen and Kelley, 1939) was designed to measure the silent reading proficiency of high school and junior college students. The test primarily includes work-study silent reading tasks that are basic to the content subjects of history, geography, science, and literature. The manual suggests that "progress in these subjects depends to a greater degree upon the ability of pupils to read rapidly and intelligently than upon any other single factor."[6]

The test measures three general areas of silent reading abilities: 1) rate of reading at a controlled level of material difficulty; 2) comprehension of words, poetry, sentences, paragraphs, and longer selections; and 3) ability to use skills required to locate information. Each of these areas is covered in a number of different ways by means of 11 different types of materials arranged in seven subtests. The results are reported in nine different subtest scores plus a total score. The first and last subtests produce two scores each. The subtests are 1) Rate and Comprehension, 2) Directed Reading, 3) Poetry Comprehension, 4) Word Meaning, 5) Sentence Meaning, 6) Paragraph Comprehension, and 7) Location of Information. A total of 45 minutes of testing time are allowed to the complete test.

Test 1: Rate and Comprehension. In this test, the examinee reads two types of prose—one containing science content and the other social studies content—at a rate which, for the reader, is most comfortable for comprehension.

The examinee reads the first article for one minute and then records the number of the sentence he or she was reading at the end of that time. The examinee then reads an additional two minutes, at which time he or she turns the booklet upside down and is given an additional two minutes to respond to 10 multiple choice items. The examinee reads the second article for one minute, records the sentence number, and then reads for an additional three minutes. He or she then turns the page and has three minutes to respond to 25 true-false questions.

The rate score is the total number of sentences read in the one-minute reading of the two articles. The comprehension scores from the two selections are combined into a single score to represent one of the nine subtest scores. Test 1 thus provides two subtest scores: Rate and Comprehension, each derived from adding the scores from the two selections.

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[6] *Iowa Silent Reading Tests: Manual of Directions*, 1939, p. 1.

Test 2: Directed Reading. This test is designed to measure comprehension without stressing memory. The test consists of an article containing 24 numbered sentences and 20 questions. The examinee reads each question and then finds the sentence in the selection that answers that question. Three minutes are allowed for this test. The content of the selection is science, the topic, glass. The score is the total number of correct responses.

Test 3: Poetry Comprehension. This test contains 20 questions relating to a part of John Keats' poem "To Autumn." The examinee is directed to read the poem very carefully before attempting to answer any of the questions about it. The answers are selected from numbered and bracketed phrases in the poem. Five minutes are allowed for this test. The score is the total number of questions answered correctly.

Test 4: Word Meaning. This test has been designed to measure understanding of words which often appear in materials used in the four major academic subjects: social science, science, mathematics, and English. The items consist of a statement which is correctly completed by one of five numbered words or phrases. The 70 items include 20 social science, 15 science, 15 math, and 20 English terms. Each part of the test has a time limit. Two minutes are allowed for the social science and English parts and one and a half minutes for the science and math sections. The numbers correct from each part are combined into a single score for this test.

Test 5: Sentence Meaning. This test contains 50 questions which the examinee answers as either "yes" or "no." The words in the sentence questions are from graded word lists. The "social frequency" of the terms used and of the content were also checked because the sentences assume that the reader has background information and a particular set of values. For example, two questions read: "Does allegiance to one's country imply loyalty?" "Are desirable laws often hard to enforce?" Four minutes are allowed for this test. The score is the number of correct minus incorrect responses.

Test 6: Paragraph Comprehension. This test includes two specific aspects of paragraph comprehension: 1) the ability to select the central topic of the paragraph and 2) the ability to identify details essential to the meaning of the paragraph. Each of the 12 paragraphs is accompanied by three multiple-choice questions. The first question pertains to the central topic and the second and third pertain to essential details. For diagnostic purposes, the pattern of answers to the different type of questions can be analyzed. The norms for the test are based upon the total number of correct responses. Nine minutes are allowed for this test.

Test 7: Location of Information. This test consists of two parts. Part A, Use of the Index, contains 15 multiple-choice items relating to a short index contained in the test. Part B, Selection of Key Words, consists of 20 items. Each item includes a question followed by four key words. The examinee is to select the one that would *not* help locate information on that question. For example, one question and its option words reads:

What is the annual cost of damage done to crops by insects?

1) insects 2) boll weevil 3) wool 4) crops

Separate norms are provided for each part. The score for each is the total number correct. Three minutes are allowed for each part of the test.

Total Median Score. The raw scores for each of the nine subtests are converted into standard scores. Tables are provided to convert the standard scores into grade percentile rank for grades 9 through 12. The median standard score of the nine subtests is the Total Median Score. Tables are provided to convert the Total Median Score to percentiles for each grade.

ISRT—Advanced: Evidence of Reliability. The *Manual of Directions: Iowa Silent Reading Test*—Advanced (1943) provides similar evidence of reliability for both split-half and Kuder-Richardson analyses as does the elementary test. The split-half reliabilities are based on a study conducted with 173 Newton, New Jersey tenth grade students and the Kuder-Richardson reliabilities are based on the total national standardization sample from 1942. The subtest reliabilities from the split-half analyses with the New Jersey tenth graders range from a low of .68 for the Poetry Comprehension subtest to a high of .86 for the Selection of Key Words subtest. The reported reliability for the Total Median Standard Score is .91. The subtest reliabilities from the 1942 standardization range from a low of .69 for the Selection of Key Words subtest to a high of .89 for the Sentence Meaning subtest. The reported reliability for the Total Median Standard Score was .93.

ISRT—Advanced: Evidence of Validity. As with the Elementary test, the manual discusses the validity of the test in terms of whether the test matches the variety of silent reading situations that a reader faces.

Again as with the Elementary test, the manual reports that the inclusion of the various subtests should be based on the relatively high contribution of each subtest to the total test score and the low correlation of each of the tests with each other. These intercorrelations are reported in the test manual and support the conclusion that the subtests are relatively uncorrelated (range from .06 to .49) and that each contributes significantly to the total score (range of subtest correlations with the total score from .39 to .81).

The Metropolitan Achievement Tests: Reading—Intermediate

The *Metropolitan Achievement Tests: Reading—Intermediate Level*: Form L (1986) was used to test the reading ability of a sample of the sixth graders in 1986. The test is "Based on the theory that achievement tests ought to assess what is actually taught in the classroom or expressly formulated in instructional objectives, so the *Metropolitan Achievement Tests*, 6th edition (MAT 6) were developed to provide accurate, dependable data regarding students' achievement in the important content areas of the school curriculum."[7] The Reading—Intermediate Level test is designed to be used with students from the beginning of grade five to the end of grade six and is made up of two subtests plus a total score.

1. Reading Comprehension. This test is made up of a series of eleven reading selections of various types including content area reading, biographies, practical reading applications, stories, descriptions, and fables and myths. Each selection is read silently by the examinees and is followed by a set of four-option multiple-choice questions. There are a total of 60 questions which must be completed in forty minutes. Most students are able to complete the test

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[7] *Metropolitan Achievement Tests*: Teacher's Manual for Interpreting, 1986, p. 20.

within the forty-minute time limit without rushing. The *comprehension* score is the number of questions answered correctly. In addition to the usual norm-referenced score, the total reading comprehension score can be converted into an instructional reading level (IRL). The IRL is a score which provides a criterion-referenced estimate of the level of material which can be used to select materials for instruction.

2. *Reading Vocabulary*. The vocabulary test assesses an examinee's ability to use context clues to select the correct word to complete a sentence. The test consists of twenty-four sentences. In each sentence there is a blank; following each sentence are four single word choices. The examinee is to choose the word that best completes the sentence. The sentences attempt to cover a variety of topics that would be of interest to fifth- and sixth-grade students. The *vocabulary* score is the total number of items answered correctly in fifteen minutes. The time limit is adequate for most students to finish the test comfortably.

3. *Total Reading Score*. The total reading score is the sum of the total of the correct responses on each of the two parts of the test. This total raw score can be converted to various norm-referenced scores including stanines, percentiles, and grade-equivalents.

***MAT—Intermediate Level: Evidence of Reliability*.** The *Teacher's Manual for Interpreting: MAT 6—Intermediate Level* (1986) provides Kuder-Richardson Formula #20 reliability coefficients for all of the Grade 6 students in the 1984-85 standardization sample. For the Vocabulary subtest the reported reliability is .85, for Reading Comprehension it is .93 and for Total Reading the coefficient is .94.

***MAT—Intermediate Level: Evidence of Validity*.** The manual discusses validity in terms of the match of the test objectives to the objectives of the curriculum which the test is to measure. An appendix includes a list of curriculum materials, state department curriculum guides, and current school syllabuses which were consulted to derive the list of objectives assessed by the test. In addition, a list of reading curriculum specialists who reviewed the test objectives is also included.

The Metropolitan Achievement Tests: Reading—Advanced 2

The *Metropolitan Achievement Tests: Reading—Advanced 2 Level*: Form L (1986) was used to test the reading ability of a sample of the tenth graders in 1986. The test follows the same theory of testing and test construction as described for the *MAT Intermediate Level*. The Advanced 2 test is designed to be used with students from the beginning of grade ten to the end of grade twelve and is made up of two subtests plus a total score.

1. *Reading Comprehension*. This test is made up of a series of ten reading selections of various types including content area reading, biographies, practical reading applications, stories, descriptions, and fables and myths. Each selection is read silently by the examinees and is followed by a set of four-option multiple-choice questions. There are a total of 50 questions which must be completed in thirty minutes. Most students are able to comfortably complete the test within the thirty-minute time limit. The *comprehension* score is the number of questions answered correctly. The same criterion-referenced and

norm-referenced scores that can be derived for the Intermediate Level can also be determined for the Advanced 2 Level.

2. *Reading Vocabulary*. The vocabulary test uses the same format as for the Intermediate Level and so need not be discussed again.

3. *Total Reading Score*. The total reading score is the sum of the total of the correct responses on each of the two parts of the test. This total raw score can be converted to various norm-referenced scores including stanines, percentiles, and grade-equivalents.

***MAT—Advanced 2 Level: Evidence of Reliability*.** The *Teacher's Manual for Interpreting: MAT 6—Advanced 2 Level* (1986) provides Kuder-Richardson Formula #20 reliability coefficients for all of the Grade 11 students in the 1984-85 standardization sample. For the Vocabulary subtest the reported reliability is .84, for Reading Comprehension it is .92 and for Total Reading the coefficient is .94.

***MAT—Advanced 2 Level: Evidence of Validity*.** The manual discusses validity in terms of the match of the test objectives to the objectives of the curriculum which the test is to measure. An appendix includes a list of curriculum materials, state department curriculum guides, and current school syllabuses which were consulted to derive the list of objectives assessed by the test. In addition, a list of reading curriculum specialists who reviewed the test objectives is also included.

Descriptions of the Samples

The 1944-1945 study represented the population for the whole state with a large sample, while the 1976 and 1986 studies selected stratified random samples.

1944-1945 Samples

Elementary and high schools participating in the 1944-1945 study volunteered after the project was introduced by the Indiana State Department of Public Instruction. Although this did not allow for control of the number of schools of a particular size, type, or locality, the researchers at the time concluded that the samples were representative because they were 25% of the total population in each of the two grades and because the participating schools at each level were widely spread geographically over the state.

At each level, the participating schools were classified as either 1) "township," 2) "city," or 3) "special." The latter included "parochial, special, town, state laboratory, joint township, consolidated town and township, and joint town and township schools." No rationale for the classification distinction between "township" and some similar descriptions in the "special" category was reported.

***Sixth-grade sample*.** A total of 15,206 sixth graders from 648 elementary schools took part in the 1944-1945 testing. The schools included 388 township, 213 city, and 47 special schools. The number of sixth graders from each type were 5,799 township (38% of the sample); 8,313 city (55% of the sample); and 1,094 special (7% of the sample).

***Tenth-grade sample*.** A total of 11,424 sophomores from 243 high schools took part in the 1944-1945 testing. Of these, 3,257 (28% of the sample) were

from 153 township schools; 7,232 (63% of the sample) were from 66 city schools; and 935 (9% of the sample) were from 24 special schools.

1976 and 1986 Samples

In 1976 approximately 8,000 sixth graders from 117 schools and 7,000 tenth graders from 31 schools were tested. This represented an 8% sample of the sixth-grade and a 6% sample of the tenth-grade population of the state. The 1986 sample included 8,814 sixth graders from 117 elementary or middle schools and 8,023 tenth graders from 40 high schools. The 1986 sixth grade sample represented 13% of the students and the tenth-grade sample represented 10% of the students. Also, in 1986 the MAT was administered to a subsample of 1,010 sixth graders and 931 tenth graders. The MAT sample constituted slightly over 10% of the students to whom the ISRT had been administered.

Consolidation and other factors made it impossible to select the 1976 and 1986 samples from any plan based on the specific schools participating in the 1944-1945 study. Therefore, it was decided to draw a sample stratified to guarantee a representative sample for both the 1976 and 1986 studies.[8]

The samples were stratified on two variables—the region of the state and the type of community comprising the population center of the school corporation. Regions of the state were classified as follows:

1) North—approximately the area north of U.S. Route 40 (*excepting* classification 2 and 3 below)
2) Northwest—Lake, Porter, and LaPorte counties
3) Indianapolis area—Marion, Boone, Hamilton, Hendricks, Morgan, Johnson, Shelby, and Hancock counties
4) South—balance of the state

The communities were classified as one of the following five types, using the population figure of the area where the school corporation is centered:

1) Urban—school corporations with population centers exceeding 50,000 persons
2) Rural—school corporations with population centers of less than 10,000 persons
3) Large Town—school corporations with population centers of between 10,000 and 20,000
4) Small City—school corporations with population centers of between 20,000 and 50,000
5) Suburban—school corporation contiguous with those classified in type 1 above

The two stratifications created 20 cells (4 types by locality x 5 types of communities), and the total population figures for each cell were determined for sixth graders and for tenth graders.

Specific characteristics of the samples are described in the context chapter.

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[8] John Hesemann of the Indiana Department of Public Instruction designed the sampling plan described in the following section.

Data Analysis Procedures

Since there were important differences in the procedures used to analyze the sixth- and tenth-grade *Iowa Silent Reading Tests* results, they will be discussed separately. There are also differences in the treatment of the data from each of the three studies. Therefore the discussion of the data analysis procedures will be organized by grade level and study. The data analysis procedures for the Metropolitan Reading tests were straight forward uses of test standard scores and tables in the 1986 MAT Teacher's Manual For Interpreting.

Sixth Grade: 1944-45 Data Analyses

Because tests were given throughout this school year, the automatic use of the scoring tables in the test manual were inappropriate. It is not possible to compare the scores that one school's sixth graders achieved in grade 6.1 to the scores that another school's sixth graders achieved in grade 6.8. The average scores in grade 6.8 would be much higher by virtue of having the advantage of 7 more months of school. Therefore, the 1945 Bulletin reported the statewide reading achievement of sixth graders in the form of months of school deviation from the norm for each ISRT subtest and for the total test median score.

The first calculation to arrive at this state total was to analyze the scores for each school giving the test. Each school was assigned a grade norm based on the number of months the sixth graders had completed before the test. A school in session five months before the test had a grade norm of 6.5 for each subtest and for the total test. Each student's ISRT standard score was then obtained from the test manual for each subtest. The manual procedure of averaging the two middle standard scores for the median was followed to arrive at each student's total median score. Then the standard scores for each subtest and the total test for all the students at that school were averaged to arrive at the standard scores for the school unit. At this point the standard scores were converted to grade equivalent scores for each subtest and for the total test. Then the norm grade, in this example it is 6.5, was subtracted from each grade equivalent. The school reported differences from the norm on each subtest and total test were averaged to arrive at the state totals. These totals represent the number of months of deviation from a grade norm.

Also reported from 1944-45 were the distributions of all of the students on each subtest and the total test. These distributions report the number of students whose grade scores differed from the norm in year units. For example, if a student's score fell within four months inclusive (6.1 to 6.9) on either side of his school's grade norm (6.5), then he was average. He would be counted in the "Average" range reported. If his score fell into the ten month period below the average range (5.1 to 6.0), he would be counted in the "1-year" range. These ranged from "−3 years" to "+3 years". This distribution of students for schools was used throughout the 1945 report.

The 1945 analysis of data resulted in two statewide descriptors of reading achievement on the *Iowa Silent Reading Tests*. For each subtest and the total test, the average number of grade months deviation from a norm was reported. The other descriptor was distributions of Indiana students in terms of grade years above or below the total test norm and distributions of the schools in terms of grade years above or below the total test norm in relation to certain school variables: city, township, special; school year; school enrollment; class

size; number of grades in the classroom; time given daily and weekly to reading; and teaching reading with social studies. The state totals for ISRT standard scores, age equivalent scores, percentile scores, and grade equivalent scores were not directly reported in the 1944-45 study.

Sixth Grade: 1976 Data Analyses

Because all of the sixth graders took this test at the same time of the school year, grade 6.2, it was not necessary to calculate each schools deviation from its own grade norm to get statewide totals. The statewide totals were the average of ISRT standard scores aggregated on a school-by-school basis for the subtests and total test median score. This averaging of school standard scores paralleled the 1945 data analysis procedures, except that in 1976 standard score means were derived and in 1945 grade months different from norm means were derived. Several comparisons between 1945 and 1976 scores required additional data analysis procedures.

The first comparison presented the Grade Equivalent months above or below the norms for the subtests and total median score. The 1945 data was already in this form. The 1976 months difference was calculated by subtracting the 6.2 grade at testing from each subtest grade equivalent, which was derived from the state standard score average using the ISRT test manual.

A second comparison made use of T-scores (mean of 50 and a standard deviation of 10). T-scores were selected to provide comparisons between subtests which have different variances for any one population or between any two populations. The T-Score procedure equalized the variances for direct comparison.[9] The test median standard scores and the test standard deviations were reported for grade six in the 1943 ISRT *Elementary Test Manual*, Form BM. For these calculations, the statewide standard scores were immediately available for 1976, but the statewide standard scores for 1945 were calculated by adding or subtracting the reported months difference from the norm on each subtest from the 1976 grade level norm of 6.2 to derive a grade equivalent score. This grade equivalent score was converted to a standard score. From this derived standard score, the 1945 T-Scores were calculated.

Both of the 1945 derived scores (grade equivalent and standard score) were then used for the 1976 and 1986 data comparisons. In cases of extrapolation or rounding of decimals for whole numbers, the closest score was used; when the choice was equal, the lower score was selected so as not to overestimate reading achievement.

A third comparison used Age Equivalents derived from the standard scores. The age equivalent comparison became important because the average age of sixth graders decreased 10 months from 1940 to 1970 as reported by the U.S. Census department. The 1976 data analysis presented comparisons with and without age adjusted scores. To adjust scores to account for the younger age of sixth graders, several steps were required. First, the 10 month age difference was added to the Age Equivalent Score achieved on the 1976 subtests and total median score. This allowed for a direct age score achievement

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[9] The formula used for this T-score was $T = 50 + 10(A-B/C)$ where A = sample standard score, B = test standard score, and C = test standard deviation.

comparison. T-Scores were then adjusted: first, the adjusted age equivalent score was used to derive an adjusted standard score from the ISRT manual tables; this adjusted standard score was used in a new calculation of the adjusted T-Score. In addition, the number of years in Grade Equivalents ahead or behind the norm for the Total Median Score was adjusted: first, the adjusted standard score was used to derive an adjusted norm for the Total Median Score; then the frequency of scores in the ranges above and below the adjusted norm were calculated.

Sixth Grade: 1986 Data Analyses

The sixth graders remained 10 months younger than the 1945 sample. Therefore, the same procedures for adjusting 1986 scores used in 1976 were used again. However, grade equivalent comparisons were presented in two ways: 1) in terms of months difference from a norm of 6.2, and 2) adjusted and unadjusted Grade Equivalent Scores for subtests and Total Median Score. The distribution of scores above and below the norm in terms of grade levels was maintained for both adjusted and unadjusted grade equivalents.

An age comparison showed the sixth graders difference in average age in the three time periods. Then, each sample's Age Equivalent Score (unadjusted) for the Total Median was subtracted from their age at the time of testing. The difference showed the number of age equivalent months behind or ahead of their age norm. This analysis procedure was a straight age comparison of unadjusted test score equivalents.

The new Grade Equivalent comparison for the Total Median Score presented the expected grade score, achieved grade score, and adjusted grade score for each time period. The 6.2 norm grade level was used as the expected grade score.

Percentile Rank comparisons were performed for all subtests. Standard scores and adjusted standard scores were used to derive percentile ranks from the 1943 ISRT test manual tables. However, a Percentile Rank comparison for the Total Median Score followed a special procedure to derive the expected achievement level for students at the 6.2 norm grade level. Because the percentile rank tables in the ISRT manual were standardized for the eighth month of the school year (6.8), a percentile rank of 50 would not be expected for a sample six months behind in grade 6.2. The standard score for grade 6.2 was used to derive the expected percentile rank for grade 6.2. The expected percentile achievement on each subtest differs because of different population variances on each subtest.

As in 1945 and 1976 the unadjusted standard scores for all the comparisons were calculated means of the standard scores achieved by the participating schools. The means of individual schools were combined to arrive at geographic (North, Northwest, South, and Indianapolis) and demographic (Urban, Rural, Suburban, Small City, Large Town) comparisons of the categories used to stratify the statewide sample. Means in each category were calculated for the number of participating schools, not students. Comparability across the broad geographic and demographic categories should be reasonably valid.

Tenth Grade: 1945 Data Analyses

The Advanced Level of the *Iowa Silent Reading Tests* uses only percentile scores for the individual subtests. Grade and Age Equivalent scores are pro-

vided for the Total Median Score only. All three types of scores are derived from standard scores tables in the 1943 *ISRT Test Manual*, Advanced, Form BM. The test manual procedure was followed to determine the Total Median standard score by selecting the middle score of the nine subtest scores.

The 1945 data was compiled by school. Each school reported its mean standard score for nine subtests and the Total Median standard score. The statewide standard scores were means of the participating school means in three categories; boys, girls, and total. Schools also reported mean percentile ranks for boys, girls, and total, and for the Total Median Score; the frequency distributions of all these scores were presented in quartiles.

The 1945 comparisons were made between city, township, and special schools for boys, girls and total. City, township, special, and total schools were also compared across length of school year and size of school. Because the testing time was not spread out like the sixth-grade testing, standard scores and directly converted percentile ranks were used in all comparisons. The testing was done in the first semester of school which would have taken approximately 4 months, from 10.0 to 10.4, making 10.2 the best approximate norm grade for the 1945 data. However, the 1945 bulletin gave the 50th percentile as the state norm for comparison. This is not reasonable, because the ISRT norm tables are based upon a standardized population in the eighth month of the school year, 10.8. The 1945 sample was tested an average of six months earlier at grade level 10.2.

Tenth Grade: 1976 Data Analyses

A change in the average age of Indiana tenth graders again was a factor in data analysis procedures for the 1976 comparisons with 1945. For the Advanced test, different procedures had to be used to make this adjustment, because age equivalent scores are not given in the 1943 ISRT test manual for the nine subtests. They are only given for the total median score. The procedure adopted was to use the ninth-grade percentile equivalents for the standard scores; this logically adjusted the scores by 12 months. However, since the testing was done at grade 10.2 and the ninth-grade norms were based on grade 9.8, this is only a four month adjustment.

A comparison was also made by using T-Scores. The 1945 standard scores were used with the ISRT test manual medians and standard deviations to calculate the 1945 T-Scores. The unadjusted standard scores for 1976 underwent the same calculation. The adjusted percentile ranks (grade 9 percentiles) for 1976 were used to derive an adjusted standard score in the grade 10 tables of the ISRT test manual. This adjusted standard score was then used in the calculation of the age adjusted T-Score.

Tenth Grade: 1986 Data Analyses

The age difference between 1945 and 1976 increased in 1986 to a 17 month difference. The grade norm remained at grade 10.2 and this was used to derive the expected percentile of achievement from the tables for the subtest scores and Total Median score. However, a new procedure was employed for adjusting the Total Median Score for the younger age of tenth graders.

Since the Total Median Score does give age equivalents, 14 months was added to the achieved age equivalent of the 1976 sample and 17 months was

added to the achieved age equivalent of the 1986 sample. Corresponding adjusted Grade Equivalents and Percentile Ranks were then derived from this adjusted standard score. This was only done for the Total Median Score on the ISRT. Age equivalents are not given for subtests, so the 1976 procedure of using the ninth-grade norms for subtest percentile scores was used to make the age adjustment.

The new procedure on the Total Median Score allowed a comparison of expected, achieved, and age adjusted scores for the statewide sample on Grade Equivalent and Percentile Rank reading achievement. The new procedure was also consistent with the age adjustment for the sixth-grade scores so a more accurate comparison could be made on the Total median score.

A comparison of the ages of tenth graders in the three time periods was also added to the tenth-grade analysis. Subtracting the unadjusted age equivalent score achieved in each time period from the average age of the sample resulted in a difference between age and age achievement. As in sixth grade, this was a straight comparison of the changes in reading achievement with respect to the age of the reader.

As in all previous analyses, the statewide standard scores were the means of the participating schools on each subtest. A comparison of these schools based upon geographic and demographic categories was also done with the tenth-grade Total Median Scores. The broad comparisons between geographic and demographic regions should be reasonably valid.

Equating Analyses in 1986

The *Metropolitan Reading Tests* was administered by 13 sixth-grade schools and 5 tenth-grade schools in the 1986 sample. The number of students equaled 14% of the sixth graders in the sample and 11% of the tenth graders.

Schools that administered both tests received specific instructions concerning the order of test administration, which was counter-balanced so that an equal number of students at each grade level took the tests in the opposite order.

The equating analyses were performed in two separate procedures. In the first procedure, the Psychological Corporation derived scaled score and percentile rank conversion tables by matching student scores on the two tests. Separate conversion tables were generated equating the *ISRT* Elementary Level, Form Bm. to the *MAT6* Intermediate Level and equating the *ISRT* Advanced Level, Form Bm. to the *MAT6* Advanced 2 Level. These tables allow the conversion of any *ISRT* scaled score to a *MAT* scaled score.

The second procedure compared the mean and standard deviation of the *ISRT* Total Median scaled score for the entire sample of schools to the mean and standard deviation of the *ISRT* Total Median scaled score for the *MAT6* sample schools. At sixth grade, the entire sample's *ISRT* mean of 148.32 and standard deviation of 5.39 was almost identical to the *MAT6* schools' *ISRT* mean of 148.38 and standard deviation of 5.99. The standard error of measurement for the 13 *MAT6* sixth-grade schools was also a low 1.49. At tenth grade, the entire sample's *ISRT* mean of 160.25 was slightly below the *MAT6* sample's *ISRT* mean of 162.80; however it is just within the lower limit of the *MAT6* sample's 2.61 standard error of measurement. The entire sample's *ISRT*

standard deviation was 5.91, compared to the 5.02 of the 5 schools which also took the *MAT6*.

The equating analyses suggests that the scores of sixth-grade sample of 13 schools who also took the *Metropolitan Achievement Tests*, was equal to the scores of the whole sample of 117 schools on the basis of the *Iowa Silent Reading Tests* Total Median Score. The tenth-grade sample of 5 schools who also took the *Metropolitan Achievement Tests* might have scores slightly above the whole sample of 40 schools on the basis of the *Iowa Silent Reading Tests* Total Median Score. Thus, the *MAT6* results at the sixth-grade level would be considered representative of the entire sample and the *MAT6* results at the tenth-grade level might slightly overestimate the reading achievement of the entire sample.

Questionnaire Data Analysis Procedures

Previous procedures used to analyze the 1944-1945 and 1976 questionnaire responses were unavailable. It is known that 648 sixth-grade schools and 243 tenth-grade schools were surveyed in 1944-1945, but the number of teachers who responded at each school is unclear because data was aggregated on a school basis for the report.

In 1976 the number of teachers who returned surveys was reported at 251 for sixth grade and 108 for tenth grade. At the sixth-grade level, 47 schools returned only one teacher questionnaire and 70 schools returned from 9 to 20 questionnaires. At the tenth-grade level, 21 schools returned only one teacher questionnaire and 10 schools returned 87 questionnaires. Questionnaire items which dealt with teachers or with teachers' opinions were compiled on the basis of all returned responses. With items dealing with information about the community or the school, only one questionnaire was selected from each of the schools returning multiple questionnaires.

In 1986 the same general procedures were used to compile the three questionnaires. One administrator questionnaire was returned from each of the 117 sixth- and 40 tenth-grade schools. Multiple teacher questionnaires were returned by many schools in the sixth- and tenth-grade samples. A total of 269 out of 427 surveys were returned at the sixth-grade level, a 63% return rate. A total of 110 out of 180 surveys were returned at the tenth-grade level, a 61% return rate. The questionnaires were packaged with the tests and mailed by the Psychological Corporation. Enough questionnaires were mailed for all sixth-grade teachers and for all language arts teachers at the tenth-grade level. The 1986 analysis used all teacher responses to compile data for items dealing with classrooms or with teachers' opinions. For items dealing with the school or community, the administrator questionnaire was used, or the average of the responses from all of the teachers surveys from each individual school.

CHAPTER 3

RESULTS

A grade equivalent comparison of the reading performance of the 1944-1945 and 1976 Indiana sixth graders with those in 1986 shows a marked improvement for the 1986 sample. With an adjustment for a 10-month age difference, the 1986 sample far outscores their earlier counterparts on every subtest and on Total Median Score.

Unadjusted percentile averages for the Indiana tenth graders show an advantage for the 1944-1945 sample. An adjustment for a 17-month age difference in 1986, however, indicates little change in reading performance over the four decades.

Age Differences in the Samples

The educational and societal factors to be considered in Chapter IV of this report suggest some interesting reasons for any differences that one might find in the reading achievement of children between 1944-1945 and 1986. One of these factors, however, is so important to the interpretation of the test data for both grades that it needs to be introduced at the outset of the presentation of the results of this comparative study. An analysis of the Census Bureau reports for 1940, 1970, and 1980[10] reveals that the average age of Indiana sixth graders at the time of the census in 1940 was 12 years and 4 months. In the 1970 and the 1980 census, the average age of Indiana sixth graders had fallen to 11 years and 6 months. It would be interesting to study the reasons for this 10-month decrease in average age.

It is known that retention was practiced in the schools in the 1940's much more than in the schools of the last decade. As we shall see, by the time children in 1940 reached the tenth grade, they were an average of 14 months older than their 1976 counterparts and 17 months older than their 1986 counterparts, indicating that the age of students increased at the higher grade levels. If retention is accepted as a major explanation for the age difference, one might argue that the 10-month advantage for the 1944-1945 sixth-grade sample represents, to some degree, more time in school or "school experience." It certainly represents the potential of more time for students to read, and amount of reading is a major factor in improving reading ability. The age difference appears to be a strong advantage for the 1944-45 sixth- and tenth-grade students over their 1976 and 1986 counterparts.

Based on the 10-month difference in the average age of Indiana sixth graders in 1940 and in 1970 and 1980, and on the 17-month difference in the average age of Indiana tenth graders in 1940 and 1980, a new analysis for comparison seemed appropriate in this study. To make this comparison, age equivalent scores were determined for the 1944-1945, 1976, and 1986 samples using the data analysis procedures described in Chapter Two. Because of the procedure necessary to arrive at age equivalent comparisons for the two grades, the resulting age equivalent scores for both sixth and tenth grades are referred to throughout this report as "adjusted" or "age-adjusted" scores. They are, however, as reasonable a perspective on reading achievement as are grade equivalents.

In considering reading performance, it is as valid to norm by age as it is to norm by grade level equivalent. In fact, the 1943 elementary test manual makes this point by presenting both age and grade equivalents in its table for converting standard scores. In his 1961 study, Gates (1961) relied solely on age-equivalent comparisons that adjusted the reading scores of the children tested in 1947 before they were compared to those tested in 1937. Finch and Gillenwater (1949) considered chronological age differences in a 1949 study comparing the reading performance of 1931 sixth graders to those in 1949. In addition, the primary analysis of The National Assessment of Educational Progress is designed to compare age equivalent groups over time.

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[10] *Census of the United States, Part 16: Indiana*. U.S. Census Bureau: U.S. Government Printing Office, Washington, D.C., 1940, 1970, and 1980.

Stedman and Kaestle (1987) support the use of age equivalent comparisons as more stable than any other standard. However, they criticized the 1976 "Indiana Then and Now" for overadjusting the age comparisons by simply adding the number of months to the students' scores, presuming that the 1976 students would have gained one extra month for every additional month in school. They also suggested that 1976 sixth graders at the top performance levels would hardly gain any months in score if they were 10 months older when tested. A procedure for adding a percentage of months to the scores based upon the performance level was not devised for this report for three reasons: 1) consistency with the previous 1976 data analysis, 2) determining the percentage of months to add is not a clear procedure, and 3) the 1943 norms for age equivalent scores were based on the eighth month of the school year and the 1976 and 1986 testings were in the second month of the school year. Therefore, the 1976 and 1986 samples were already disadvantaged several months from the 1944-1945 sample in which students were tested throughout the year and difference scores were determined relative to the exact month of testing.

Sixth-Grade Test Results

Comparison of the results from the sixth-grade testing for 1944-1945, 1976, and 1986 reveals that reading achievement remained at the expected grade level for the first two samples which were three decades apart. Then, as Figure 3 shows, a substantial increase in reading achievement in 1986 exceeded the expected grade level of 6.2. With further adjustment for the age factor, each successive sample far outscored their previous counterparts on the Total Median Score.

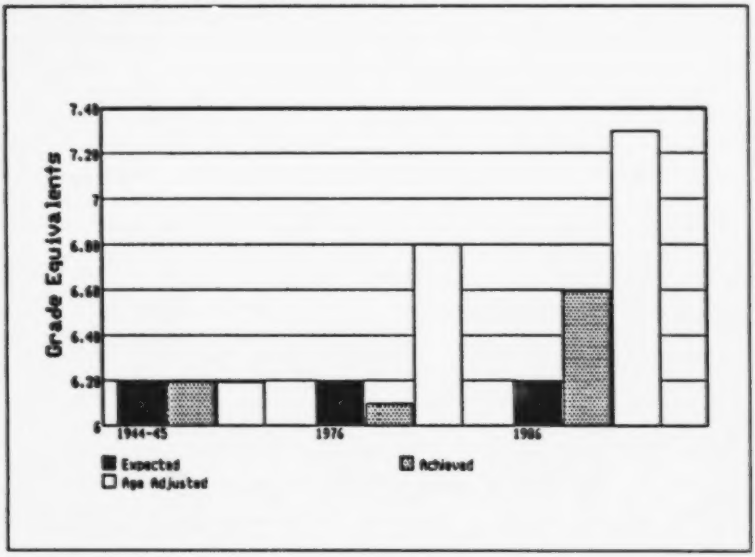
Unadjusted Sixth-Grade Results

Grade-equivalent norms. The 1944-1945 study reports its sixth-grade results as grade equivalent differences to norms given in the 1943 ISRT *Manual of Directions*. These are arrived at by deriving standard scores from raw scores on the eight subtests, by determining the Total Median Score, and by converting these nine scores into grade equivalents using a conversion table in the 1943 test manual. Thus when this 1986 comparison refers to months above or below the norm, it means that the average score of the sample referred to is plus or minus that number of months from the grade level norm. For example, the 1944-1945 sample is one month above the norm on the Directed Reading subtest, the 1976 sample is two months above, and the 1986 sample is five months above. Thus the grade equivalent scores for 1986 sixth graders on this subtest averaged four months above the average score for the 1976 students and five months above the average score for the 1944-1945 students.

Comparison of the Samples Across Subtests. Before making the 10-month adjustment for the 1976 and 1986 students, the grade equivalent comparison in Table 1 shows that the 1944-1945 sixth grade students scored at the grade norm on two subtests: Sentence Meaning and Use of Index; below the grade norm on four: Rate, Comprehension, Word Meaning, and Paragraph Comprehension; and above the grade norm on two: Directed Reading and Alphabetizing. The 1976 sixth graders scored at the grade norm on two subtests:

Figure 3

Expected, Achieved, and Age Adjusted Total Median Grade Equivalent Scores for Indiana Sixth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)-Elementary (1939)



Word Meaning and Sentence Meaning; below the grade norm on three: Rate, Comprehension, and Paragraph Comprehension; and above the grade norm on three: Directed Reading, Alphabetizing, and Use of Index. The 1986 sixth graders scored below the grade norm on two subtests: Comprehension and Sentence Meaning; and above the grade norm on the remaining six subtests. The 1944-1945 sixth graders scored at the grade norm on the Total Median Score, the 1976 sample dipped one month below the grade norm, and the 1986 sample improved to four months above the grade norm.

The 1986 sixth graders equaled or outscored their 1944-1945 and 1976 counterparts on all but one subtest: Sentence Meaning. There was no change in the Comprehension subtest for the three samples. On the basis of the normed distributions and the standard error of measurement of the test, it was decided for the purposes of this study that differences by months of grade equivalence would not be considered educationally significant unless they were three months or more. As Table 1 presents, all comparisons are significant improvements except for the Comprehension subtest in which all three samples performed equally well and the Sentence Meaning subtest where the 1986 sample had a

significant five month drop. Highly significant gains for the 1986 students are evident for subtest measures of Rate, Alphabetizing, and Use of Index.

Table 1

Comparison of Grade Score Differences by Indiana Sixth Graders (1944-1945, 1976, and 1986) Based on Grade Norms for the Iowa Silent Reading Tests (BM Edition)-Elementary (1939) in the 1943 Manual

Subtest	Years Above or Below the Norm*			Change from 1944 to 1986 (+ or -)	Change from 1976 to 1986 (+ or -)
	1944	1976	1986		
Rate	- .4	- .6	+ .5	+ .9	+1.1
Comprehension	- .5	- .5	- .5	0	0
Directed Rdg.	+ .1	+ .2	+ .5	+ .4	+ .3
Word Meaning	- .2	0	+ .4	+ .6	+ .4
Paragraph Comp.	- .2	- .6	+ .1	+ .3	+ .7
Sentence Mng.	0	0	- .5	- .5	- .5
Alphabetizing	+ .4	+1.2	+2.3	+1.9	+ .8
Use of Index	0	+ .4	+ .9	+ .9	+ .5
Total Median Score	0	- .1	+ .4	+ .4	+ .5

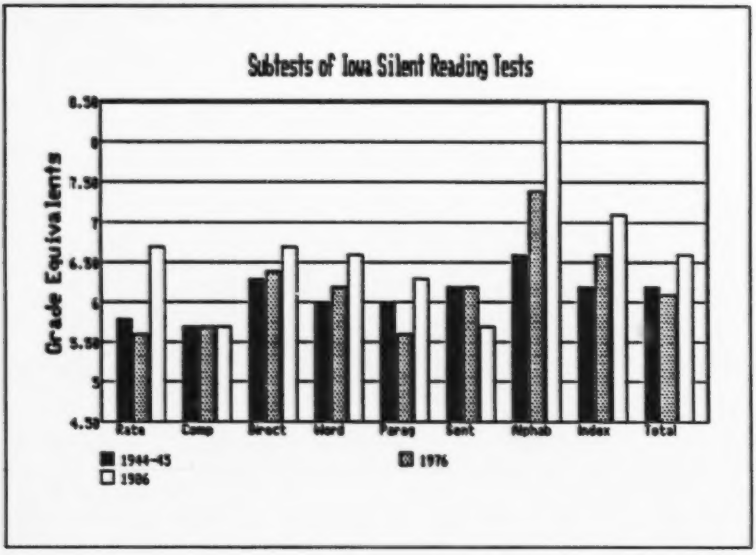
The test norms used in Table 1 are based on a 10-month school year, and the grade equivalent scores based on these norms are expressed in whole numbers (for years) and decimals (for months). For example, 6.4 would mean four months into sixth grade. The testing in 1976 and 1986 took place the second month into sixth grade, so the expected grade level would be 6.2. Although the testing in 1944-1945 was spread out over the entire year and reported only in average months above or below the norm at the time of testing; the base grade equivalent of 6.2 was used for the 1944-1945 sample and the reported months' difference was added to or subtracted from this 6.2 norm. Thus, Figure 4 shows the grade equivalent scores for the subtests and Total Median Score for the three samples. The 1986 sample shows large increases over the 1976 sample in three subtests: Rate, Paragraph Comprehension, and Alphabetizing. The 1986 students also scored much higher than the 1944-45 sample on four subtests: Rate, Word Meaning, Alphabetizing, and Use of Index.

Figure 5 shows a similar pattern in the percentile scores for the subtests and Total Median Score. The expected percentile rank for the Total Median Score is not the normal 50th percentile because the percentile rank tables in the *ISRT* test manual were standardized for the eighth month of the school year (6.8), and the grade used for sample comparisons is 6.2. The standard score for grade 6.2 was used to derive the expected percentile rank of 35 for the Total Median Score. Figure 5 again demonstrates that the 1986 sixth graders made gains in reading achievements even without age adjustments. The Total Median Score gain was 13 percentile points.

T-Score comparison—sixth grade, unadjusted. In addition to the grade equivalent comparison in Table 1, the standard scores for the 1944-1945, 1976,

Figure 4

Grade Equivalent Scores for Indiana Sixth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)-Elementary (1939)



and 1986 populations were converted to T-Scores in Table 2.[11] While the comparison of T-Scores is basically the same as the grade equivalent comparisons, the T-Score comparison takes into account the different distributions of the scores for each of the subtests. In addition, the T-score comparisons tend to minimize small differences across samples.

Adjusted Sixth-Grade Results

Subtracting the average age of the sixth graders in each of the three samples from their age equivalent Total Median Score on the *ISRT* finds the 1986 Indiana sixth graders the only ones to exceed their age equivalent norm. Figure 6 clearly shows in the "Difference" bars that the 1944-1945 and 1976 sixth graders scored behind in the expected age equivalent score. This analysis of unadjusted age equivalent scores supports the adjustment of scores in Table 3 for comparison of subtest performance between the three samples.

To make the age-adjusted comparison in Table 3, the age equivalents for the grade equivalents are taken from the test manual conversion table for the

[11] This conversion is explained in the Chapter 2 section on data analysis.

Figure 5

Percentile Rank Scores for Indiana Sixth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)-Elementary (1939)

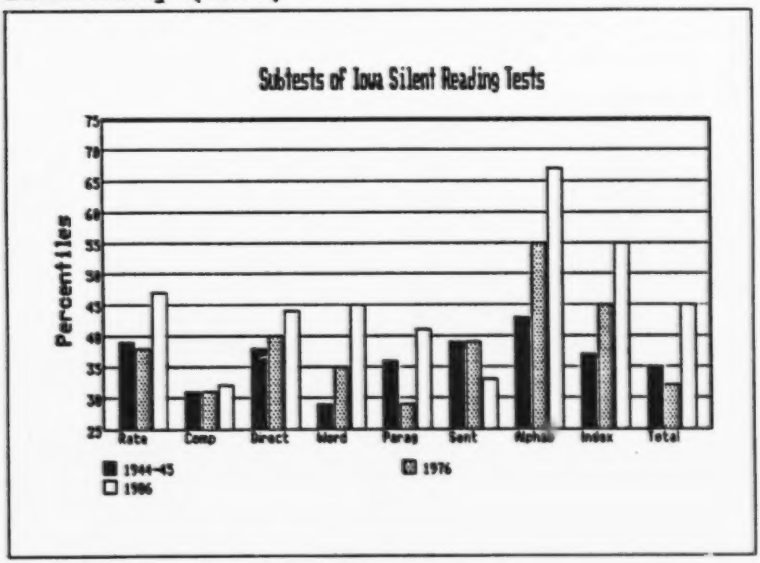


Table 2

T-Score* Comparisons of Indiana Sixth Graders (1944-1945, 1976, and 1986) for the Iowa Silent Reading Tests (BM Edition)-Elementary (1939)

Subtest	Mean T-Score Achieved by 1945	1976	1986	Mean T-Score Difference Between 1945-1986	1976-1986
Rate	47.4	46.9	49.3	+ 1.9	+ 2.4
Comprehension	45.3	45.3	45.5	+ .2	+ .2
Directed Reading	47.7	48.2	48.6	+ .9	+ .4
Word Meaning	45.1	46.3	48.7	+ 3.6	+ 2.4
Paragraph Comp.	46.9	45.2	48.2	+ 1.3	+ 3.0
Sentence Meaning	47.2	47.2	45.6	- 1.6	- 1.6
Alphabetizing	49.9	52.4	54.3	+ 4.4	+ 1.9
Use of Index	47.0	48.8	51.3	+ 4.3	+ 2.5
Total Median Score	46.2	45.4	48.7	+ 2.5	+ 3.3

*T-Scores have a mean of 50 and a standard deviation of 10 and are based upon the mean and standard deviation given for norming samples on each subtest for the ISRT: Manual of Directions (1943).

Figure 6

Difference between the Average Age of Indiana Sixth Graders (1944-1945, 1976, and 1986) and Their Age Equivalent Achievement on the Iowa Silent Reading Tests (BM Edition)-Elementary (1939) Total Median Score

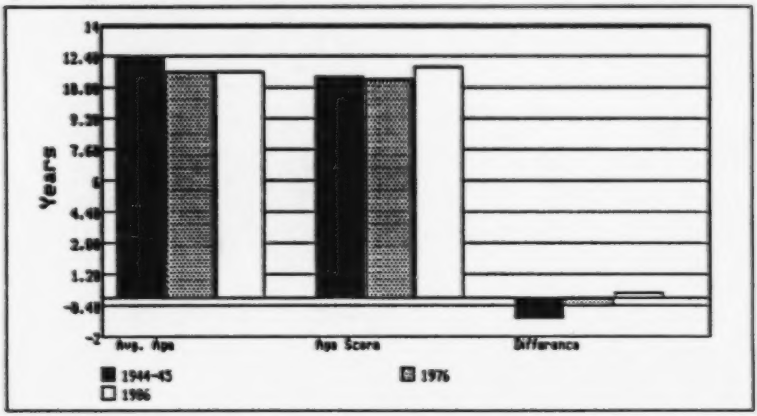


Table 3

Comparison of Age Equivalent Performance (Years and Months) by 1944-1945, 1976, and 1986 Indiana Sixth Graders on the Iowa Silent Reading Tests (BM 1939 Edition)-Elementary (1943 Test Manual) with Adjustment for the 10-Month Age Difference Between the Samples

Age Equivalent Performance: Years-Months

	Unadjusted*			Adjusted**		Change from	
Subtest	1944	1976	1986	1976	1986	1944-1986	1976-1986
Rate	10-9	10-7	11-3	11-5	12-1	+ 1-4	+ 0-6
Comprehension	10-11	10-11	10-11	11-9	11-9	+ 0-10	+ 0-0
Directed Reading	11-6	11-8	11-10	12-6	12-8	+ 1-2	+ 0-2
Word Meaning	11-0	11-3	11-9	12-1	12-7	+ 1-7	+ 0-6
Paragraph Comprehen.	11-2	10-10	11-5	11-8	12-3	+ 1-1	+ 0-7
Sentence Meaning	11-4	11-4	10-10	12-2	11-8	+ 0-4	- 0-6
Alphabetizing	11-9	12-7	13-7	13-5	14-5	+ 2-8	+ 1-0
Use of Index	11-5	11-9	12-4	12-7	13-2	+ 1-9	+ 0-7
Total Median Score	11-4	11-2	11-9	12-0	12-7	+ 1-3	+ 0-7

*Determined from conversion table in the 1943 test manual.
**The adjustment adds 10 months to the achieved age equivalent score based upon 12 months per year.

two periods; then the age adjustment is made in the 1986 and 1976 age equivalent scores. Since the average age of Indiana sixth graders at the time of the 1940 census was 12 years and 4 months and the average age of Indiana sixth graders at the time of the 1970 and 1980 census was 11 years and 6 months, the adjusted age equivalent added 10 months to the age performance of the 1986 and 1976 samples because they were 10 months younger than their 1944-1945 counterparts.

With the adjustment in Table 3, the 1986 sample outscored the 1944-1945 sample significantly on every test, ranging from four months on Sentence Meaning to two years and eight months on Alphabetizing. However, 1986 gains over 1976 were only a half a year on most subtests with no gain on the Comprehension subtest and a six month decrease on the Sentence Meaning subtest. With the adjustment, the 1986 gain on the Total Median Score is seven months from 1976 and one year and three months from 1944-1945.

Using the 1943 *ISRT Manual of Directions* the adjusted age equivalent scores were converted into adjusted grade equivalent and adjusted percentile scores. Figures 7 and 8 show substantial gains by the 1986 sixth graders in grade equivalents on the Total Median Score and four subtests: Rate, Paragraph Comprehension, Alphabetizing, and Use of Index; and in percentile ranks on the Total Median Score and on four subtests: Word Meaning, Paragraph Comprehension, Alphabetizing, and Use of Index.

T-Score comparison--sixth grade, adjusted. As with the unadjusted sixth grade results, the mean standard scores were converted to T-Scores and compared in Table 4. These T-Score comparisons are basically the same as the results with the age equivalent comparisons in Table 3. However, small differences are minimized with T-Score comparisons.

Table 4

Comparison of T-Scores** of Indiana Sixth Graders (1944-1945, 1976, and 1986) for the Iowa Silent Reading Tests (BM Edition)-Elementary (1943) with Adjustment for the 10-Month Age Difference

	Mean T-Score Achieved by			Mean T-Score Difference Between	
Subtest	1945	1976*	1986*	1945-1986	1976-1986
Rate	47.4	48.9	49.9	+ 2.5	+ 1.0
Comprehension	45.3	48.8	48.8	+ 3.5	0.0
Directed Rdg.	47.3	52.3	51.6	+ 4.3	- .7
Word Meaning	43.1	50.6	52.9	+ 7.8	+ 2.3
Paragraph Comp.	46.9	48.9	51.0	+ 4.1	+ 2.1
Sentence Mng.	47.2	51.1	48.4	+ 1.6	- 2.7
Alphabetizing	49.9	54.2	55.3	+ 5.4	+ 1.1
Use of Index	47.0	52.9	54.2	+ 7.2	+ 1.3
Total Median Score	46.2	50.0	52.7	+ 6.5	+ 2.7

*Age adjusted using procedures described in Methods Chapter II.
**T-Scores have a mean of 50 and a standard deviation of 10 and are based upon the mean and standard deviation given for norming samples on each subtest in the Iowa Silent Reading Test: Manual of Directions (1943).

Table 5 breaks down the Total Median Score for the samples from the three periods according to the number and percentage of subjects who scored

Figure 7

Age-Adjusted Grade Equivalent Scores for Indiana Sixth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)- Elementary (1939)

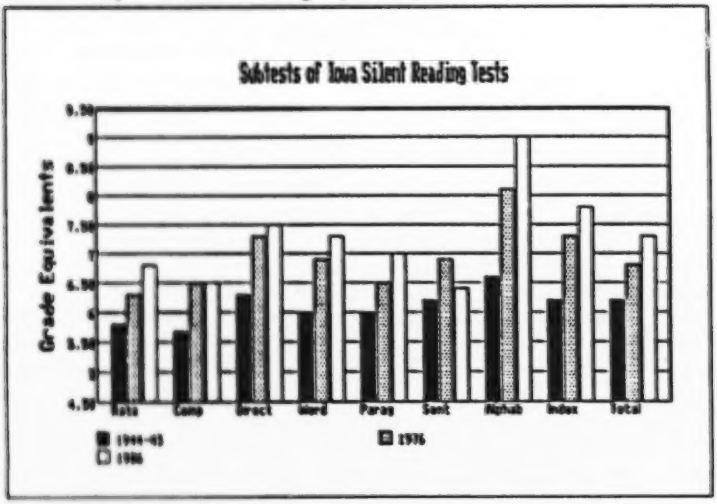


Figure 8

Age-Adjusted Percentile Rank Scores for Indiana Sixth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)- Elementary (1939)

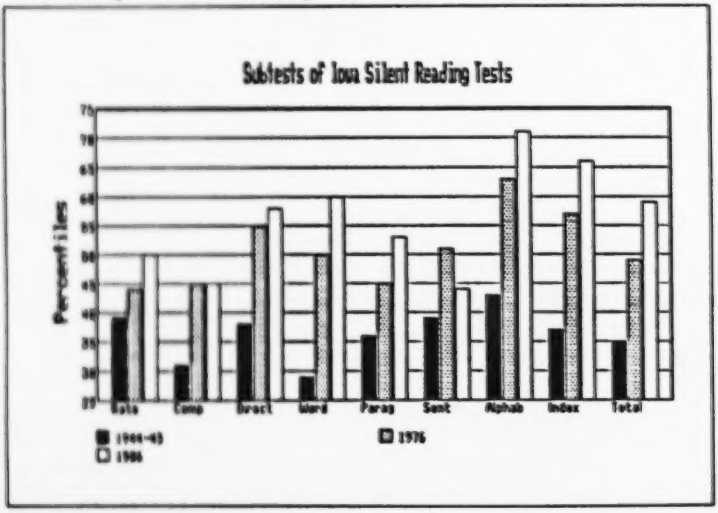


Table 5

Distribution of Total Median Scores for 1944-1945, 1976, and 1986 Indiana Sixth Graders on the Iowa Silent Reading Tests (BM Edition)- Elementary (1943), Showing Number of Subjects and Percentage of Total Samples According to Years Behind or Ahead of the Grade Equivalent Norm

		Years Behind or Ahead of Norm*						
		-3	-2	-1	Norm	+1	+2	+3
1944-1945	#	707	2069	3727	3219	2498	1440	1546
	%	4.6	13.6	24.5	21.2	16.4	9.5	10.2
1976 Unadjusted	#	209	885	1626	1306	1124	571	510
	%	3.4	14.2	26.1	21.0	18.0	9.2	8.2
1976-Age Adjusted**	#	54	405	1086	1383	1731	816	780
	%	0.9	6.5	17.1	22.2	27.8	13.1	12.5
1986 Unadjusted	#	492	893	1756	2313	1531	852	942
	%	5.6	10.5	19.9	26.3	17.3	9.7	10.7
1986-Age Adjusted**	#	324	203	1066	2110	2076	1419	1616
	%	3.7	2.3	12.1	23.9	23.6	16.1	18.3

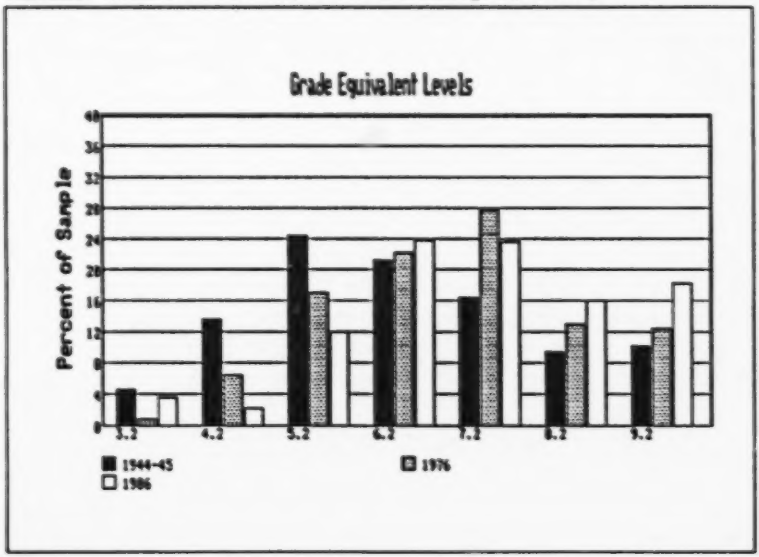
*The range for each column is 10 months. The norm is grade 6.2.
**The adjusted data is based upon the adjusted grade equivalent scores from the 1943 manual.

one, two, or three years behind or ahead of the sixth-grade level. The breakdown for the 1976 and 1986 sixth graders is refigured after their scores are adjusted for the 10-month age difference. Since the grade equivalent norms for the test are represented as 10-month school years, each column in Table 5 represents a 10-month spread around the grade equivalent norm.

Figure 9 translates the Table 5 percentage data for the 1944-1945 and the adjusted 1976 and 1986 samples into a bar graph representation. The most frequent grade level score in 1945 was 24.5% at grade level 5.2. The most frequent grade level score in 1976 was 27.8% at grade level 7.2. Although the most frequent grade level score in 1986 dropped to 23.9% at grade level 6.2, the 34.4% at grade levels 8.2 and 9.2 is a large increase over the 25.6% in 1976 and the 19.7% in 1944-1945 at the same grade levels above. Overall in 1986, 58% of sixth graders scored above a grade equivalent of 6.7. This compares to 36.1% in 1945 and 53.4% in 1976.

Figure 9

Distribution of Age-Adjusted Total Median Scores for Indiana Sixth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)-Elementary (1939)



Sixth-Grade Results in Stratified State Sectors. The 1976 and 1986 studies included a representative sample of schools based from four geographic areas: North, Northwest, South, and Indianapolis; and five school types: Urban, Rural, Suburban, Small City, and Large Town. The 1944-1945 study reported results for three school type divisions: City, Township, and Special. No 1986

category is similar to the 1944-1945 Special schools; however the Urban and Rural categories are similar to the City and Township categories making a comparison possible. The remaining 1986 categories are included in Table 6, which reports the grade equivalent scores for the geographic and school type divisions.[12]

The 1986 rural sixth graders scored at grade 6.7, significantly higher than their 1944-1945 township counterparts at grade level 6.18. However, the 1986 urban sixth graders scored at grade level 6.3, only slightly above their 1944-1945 counterparts at grade level 6.15.

Table 6

Comparison of Sixth Graders Grade Equivalent Scores on the Iowa Silent Reading Tests (1939, Elementary Form Bm) in Indiana Geographic and School Type Categories for 1944-1945 and 1986

Category	# Schools		Total Median Grade Equivalent Score	
	1944-1945	1986	1944-1945	1986
Urban	288	38	6.15	6.3
Rural	394	29	6.18	6.7
Suburban	*	25	*	6.8
Small City	*	6	*	6.2
Large Town	*	17	*	6.5
North	*	50	*	6.7
Northwest	*	19	*	6.5
South	*	35	*	6.5
Indianapolis	*	11	*	6.2

*The 1944-1945 study did not report scores for these categories. The 1976 study did not report scores for any categories.

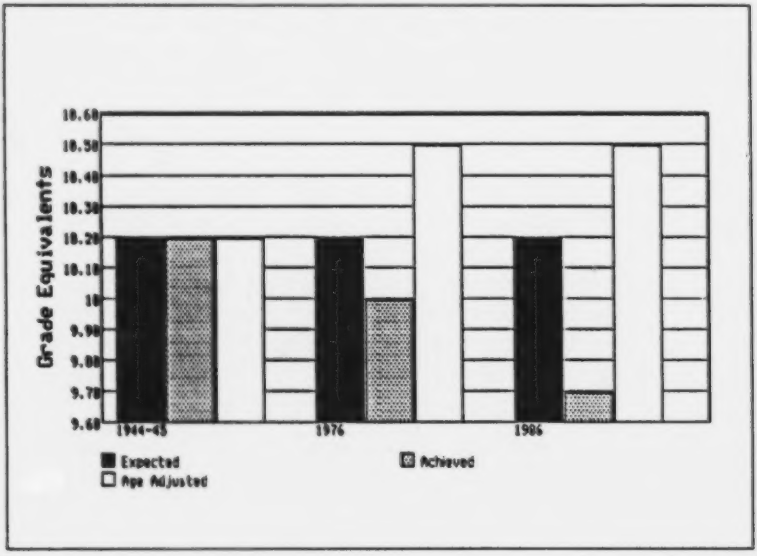
Tenth-Grade Test Results

Without adjustment for the age difference, Figure 10 shows that the tenth-grade Total Median Score dropped two months in 1976 and another three months in 1986 to five months below the 1944-1945 level of grade 10.2. Again the norm expected at the time of testing in all three samples was a grade level 10.2. When the 1976 14-month difference in ages and the 1986 17-month difference in ages is taken into account, both the 1986 and 1976 sophomores score at grade level 10.5, three months above their 1944-1945 counterparts.

[12] The 1976 study did not report results for these divisions.

Figure 10

Expected, Achieved, and Age Adjusted Total Median Grade Equivalent Scores for Indiana Tenth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)-Advanced (1939)



The advanced *Iowa Silent Reading Tests* (1939) uses percentiles rather than grade equivalents for norm interpretations on subtests. This means, for example, if a student scored at the 42nd percentile, he or she scored equal to or better than 42% of the children of that grade on whom the test had been normed. A percentile score of 42 also means that 58% of the norm population scored higher than this particular student.

The 50th percentile is usually considered the average score on a normed test like the *ISRT*. However, the *ISRT* was normed in the eighth month of the tenth-grade year and the test administration for all three studies took place in the second month of the tenth-grade year. According to the test manual tables, the 42nd percentile is the normal Total Median Percentile for the average student in grade 10.2.

Unadjusted Tenth-Grade Test Results

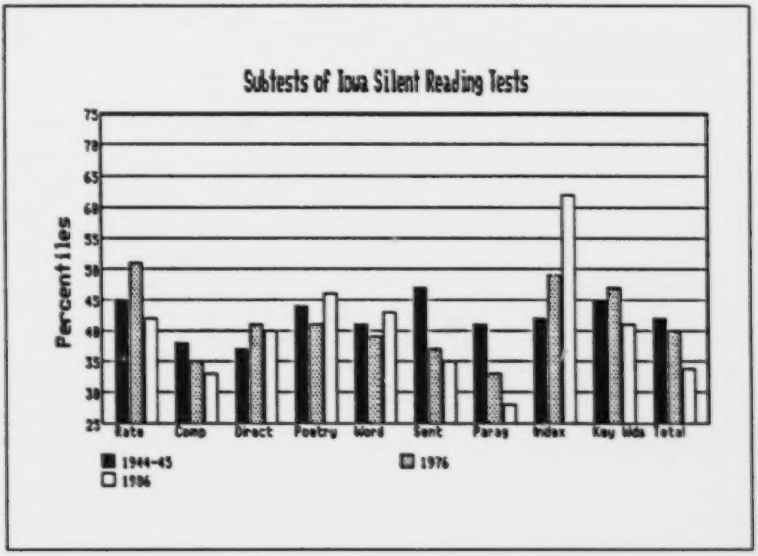
When the age difference is ignored for the data presented in Table 7 and Figure 11, the 1944-1945 tenth graders scored at higher percentiles than did the 1986 sample on five of the nine subtests: Rate, Comprehension, Sentence Meaning, Paragraph Comprehension, and Selection of Key Words. The 1976

sample scored at higher percentiles than did the 1986 sample on these same five subtests plus the Directed Reading subtest.

The 1986 sample scored higher than the 1976 and 1944-1945 samples on three subtests: Poetry Comprehension, Word Meaning, and Use of Index. The 1986 Total Median Score was down six percentile points from 1976, and eight percentile points from 1944-1945 when students scored at the expected norm level of the 42nd percentile.

Figure 11

Percentile Rank Scores for Indiana Tenth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)-Advanced (1939)



On the basis of the normed distributions and the standard error of measurement of the test, it was arbitrarily decided to consider a percentile difference of three points as significant. With this point of view, (again ignoring the age difference) many subtest score comparisons are of special interest. The 1986 sophomores made dramatic increases over 1944-1945 and 1976 students on the Use of Index subtest. But, the 1986 sophomores had large decreases from 1944-1945 levels on the Sentence Meaning and Paragraph Comprehension subtests and from the 1976 level on the Rate subtest. Smaller significant decreases between the 1986 and 1944-1945 percentile scores occurred on three other subtests: Rate, Comprehension, and Using Key Words; and between 1986 and 1976 on two subtests: Paragraph Meaning and Using Key Words. The 1986 sophomores did make significant gains over the 1976 sample, but

not over the 1944-1945 sample, on the Poetry Comprehension and Word Meaning subtests. The Total Median Score declines of six percentiles from 1976 and eight percentiles from 1944-1945 are considered significant differences.

T-Score comparisons—tenth grade, unadjusted. As with the sixth-grade results, the mean standard score for each subtest was converted to a T-Score in Table 8. This conversion was done by using the mean and the standard deviation of the standard scores for each subtest and the reported standard score mean and deviation in the 1943 *ISRT Manual of Directions*. While this comparison of T-Scores is basically the same as the percentile differences, the T-Score comparison takes into account the different distributions of the scores for each of the subtests. In addition, the T-Score comparisons tend to minimize small differences.

Adjusted Tenth-Grade Results

The U.S. Census Bureau figures show Indiana high school sophomores to be an average of 16 years and 7 months in 1940, 15 years and 5 months in 1970, and 15 years and 2 months in 1980. This decrease in average age seems to be a logical extension of the age difference found for sixth graders for the same periods. While the difference at sixth grade was 10 months, it is reasonable to assume that if promotion policies in the late 1930's and early 1940's tended to retain more students, the age differences would increase with grade levels.

A comparison of the changes in reading performance with respect to the age of the reader is shown in Figure 12. The Total Median score in age equivalents should be equal to the average age of the sample. All three samples were below their average age in the age score performance on the *ISRT*. The 1944-1945 sophomores were the farthest below, because they were also the oldest students. The youngest sample of sophomores in 1986 is farther behind their age score performance than the slightly older 1976 students. The 1976 sophomores performed at the highest level in terms of the least amount of difference between their average age and the age equivalent score. This form of age and age score comparison supports the adjustment of scores for further comparisons.

Two procedures were used to adjust the tenth grade scores for age differences: 1) norm percentiles for ninth graders were used instead of the tenth-grade norms on the nine subtest scores, and 2) 14 months for 1976 and 17 months for 1986 were added to the age equivalent Total Median Score and an adjusted standard score was derived only on the Total Median. The first procedure actually adjusted the subtest scores by only 12 months. The second procedure gave a better adjustment because it used age equivalent norms to do an age adjustment, but this procedure could not be done with the subtests because the Total Median Score is the only score for which age equivalents are given. Subtest score tables are only provided for percentile ranks by the 1943 *ISRT Manual of Directions*. Figure 13 shows the adjusted percentile rank scores presented in Table 9.

Table 9 shows the marked improvement for the 1986 sophomores over their 1944-1945 counterparts on three subtests: Use of Index, Directed Reading, and Word Meaning. Slight improvement was made on three other subtests: Comprehension, Poetry Comprehension, and Using Key Words. However, even

Table 7

Percentile Comparisons of the Performance of Indiana Tenth-Grade Students in 1944-1945, 1976, and 1986 (Unadjusted) on the Iowa Silent Reading Tests (BM Edition)-Advanced (1939)

Subtest	Percentile Rankings* 1944	1976	1986	Percentile Change 1944-1986 (+ or -)	1976-1986 (+ or -)
Rate	45	51	42	- 3	- 9
Comprehension	38	35	33	- 5	- 2
Directed Reading	37	41	40	+ 3	- 1
Poetry Comprehension	44	41	46	+ 2	+ 5
Word Meaning	41	39	43	+ 2	+ 4
Sentence Meaning	47	37	35	-12	- 2
Paragraph Comprehension	41	33	28	-13	- 5
Use of Index	42	49	62	+20	+13
Selection of Key Words	45	47	41	- 4	- 6
Total Median Score	42	40	34	- 8	- 6

*The Norm comparisons are those provided in the Iowa Silent Reading Tests-Advanced Test: Manual of Directions (1939).

Table 8

T-Score* Comparisons of Unadjusted Achievement of Indiana Tenth Graders (1944-45, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)-Advanced (1939)

Subtest	Mean T-Score Achieved by 1945	1976	1986	Mean T-Score Difference Between 1945-1986	1976-1986
Rate	48.6	50.2	48.0	- .6	- 2.2
Comprehension	46.9	45.9	45.3	- 1.6	- .6
Directed Reading	46.6	47.7	47.5	+ .9	- .2
Poetry Comprehension	48.6	47.9	49.2	+ .6	+ 1.3
Word Meaning	47.6	47.1	48.2	+ .6	+ 1.1
Sentence Meaning	49.3	46.7	45.6	- 3.7	- 1.1
Paragraph Comprehension	47.3	45.2	43.7	- 3.6	- 1.7
Use of Index	47.8	49.8	52.8	+ 5.0	+ 3.0
Selection of Key Words	47.5	49.1	47.6	+ .1	- 1.5
Total Median Score	48.2	47.5	46.3	- 1.9	- 1.2

*T-Scores have a mean of 50 and a standard deviation of 10.

Figure 12

Difference between the Average Age of Indiana Tenth Graders (1944-1945, 1976, and 1986) and Their Age Equivalent Achievement on the Iowa Silent Reading Tests (BM Edition)-Advanced (1939) Total Median Score

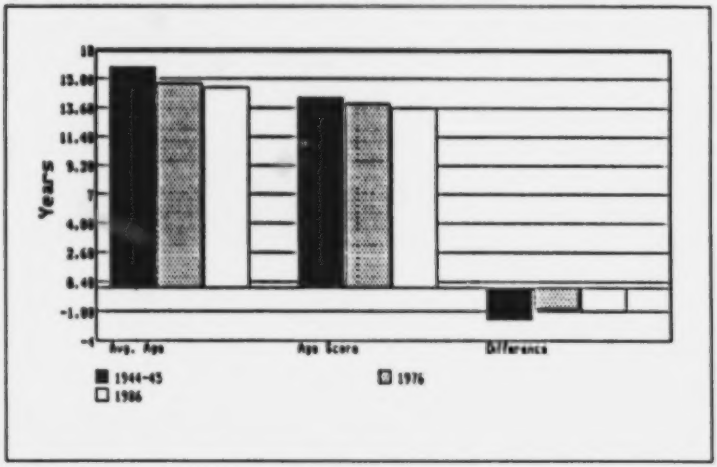
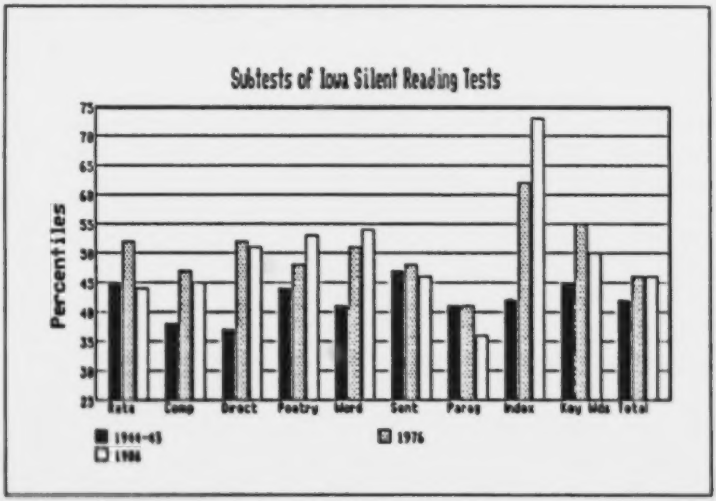


Figure 13

Age-Adjusted Percentile Rank Scores for Indiana Tenth Graders (1944-1945, 1976, and 1986) on the Iowa Silent Reading Tests (BM Edition)- Advanced (1939)



with the age adjustment, the 1986 sophomores dropped in Paragraph Meaning and slightly in Rate and Sentence Meaning.

The gains in six subtests by 1986 sophomores over 1944-1945 sophomores were tempered by the decreases from 1976 in six subtests: significant declines on the subtests of Rate, Paragraph Meaning, and Using Key Words; and slight declines on the subtests of Comprehension, Directed Reading, and Sentence Meaning. The three improved scores by 1986 sophomores over their 1976 counterparts were in the Use of Index, Poetry Comprehension, and Word Meaning subtests.

The 1986 Total Median Score was four percentiles higher than the 1944-1945 Total Median Score; however, the comparison with the 1976 Total Median Score shows no gains in reading performance for the last decade.

It is interesting to note that, with the adjustment, the 1986 sample scored above the 50th percentile on five of the nine subtests. This means that age considered, they performed better in these areas than a majority of the readers on whom the test had been originally normed.

Table 9

Age-Adjusted Percentile Comparison of the Performance of Indiana Tenth Grade Students in 1944-1945, 1976, and 1986 on the Iowa Silent Reading Tests, (BM Edition)-Advanced (1939)

	Percentile Rankings*			Percentile Change	
Subtest	1944	1976	1986	1944-1986 (+ or -)	1976-1986 (+ or -)
Rate	45	52	44	- 1	- 8
Comprehension	38	47	45	+ 7	- 2
Directed Reading	37	52	51	+ 14	- 1
Poetry Comprehension	44	48	53	+ 9	+ 5
Word Meaning	41	51	54	+ 13	+ 3
Sentence Meaning	47	48	46	- 1	- 2
Paragraph Comprehension	44	48	36	- 8	- 12
Use of Index	42	62	73	+ 31	+ 11
Selection of Key Words	45	48	50	+ 5	+ 2
Total Median** Score	42	46	46	+ 4	+ 0

*These percentiles are derived by using the Norms given for ninth graders in the 1939 test manual. This adjusts for 12 months of 14-month 1976 and the 17-month 1986 differences in ages with the 1944-1945 sample.
**These percentiles are derived by adding months of age difference to the Total Median age equivalent norms.

T-Score comparison—tenth grade, adjusted. As with the unadjusted tenth-grade results, the mean standard scores were converted to T-Scores and compared. T-Score comparisons are basically the same as the results with the

percentile comparisons in Table 10. Small differences are, however, minimized with T-Score comparisons. Also, the T-Scores reported in Table 10 make mathematical corrections to T-Scores reported in the 1976 Then and Now Report.

Table 10

Comparison of T-Scores of Achievement of Indiana Tenth Graders (1944-45 and 1976) on the Iowa Silent Reading Tests (BM Edition)- Advanced (1939) with Adjustment for the 14-Month and 17-Month Age Differences Between the Samples

Subtest	Mean T-Score Achieved by 1945	1976	1986	Mean T-Score Difference Between 1945-1986	1976-1986
Rate	48.6	50.7	48.6	.0	- 2.1
Comprehension	46.9	49.7	49.0	+ 2.1	- .7
Directed Reading	46.6	50.6	50.4	+ 3.8	- .2
Poetry Comprehension	48.6	49.3	50.6	+ 2.0	+ 1.3
Word Meaning	47.6	50.1	51.2	+ 3.6	+ 1.1
Sentence Meaning	49.3	49.4	48.7	- .6	- .7
Paragraph Comprehension	47.3	47.5	45.9	- 1.4	- 1.6
Use of Index	47.8	52.8	56.0	+ 8.2	+ 3.2
Selection of Key Words	47.5	51.5	50.0	+ 2.5	- 1.5
Total Median Score	48.2	49.2	49.2	+ 1.0	+ 1.0

*T-Scores have a mean of 50 and a standard deviation of 10. Their calculation is described in the data analysis section of Chapter 2.

Tenth-Grade Results in Stratified State Sectors. The 1976 and 1986 studies included a representative selection of sample schools based upon four geographic areas: North, Northwest, South, and Indianapolis, and five school types: Urban, Rural, Suburban, Small City, and Large Town. The 1944-1945 study reported results on three school type divisions: City, Township, and Special. No 1986 category is similar to the 1944-1945 Special schools; however the Urban and Rural categories are similar to the City and Township categories making a comparison possible. The remaining 1986 categories are included in Table 11 which reports the available standard scores and percentile ranks for the tenth grade geographic and school type divisions.[13]

The 1986 rural tenth graders scored equally with their 1944-1945 township counterparts at the 37th percentile. However, the 1986 urban tenth graders scored 18 percentile points below their 1944-1945 city counterparts, an educationally significant difference in reading performance. Further comparisons

[13] The 1976 study did not report results for any of these divisions.

between 1986 categories are cautioned because these scores are based upon a test normed on a population in 1939 which may be biased against the 1986 population.

Table 11

Comparison of Tenth Grade Standard Scores and Percentiles on the Iowa Silent Reading Tests (1939, Advanced Form Bm) in Indiana Geographic and School Type Categories for 1944-1945 and 1986

Category	# Schools		Total Median Standard Score		Total Median Percentile	
	1944-1945	1986	1944-1945	1986	1944-1945	1986
Urban	66	7	163	155	42	24
Rural	153	16	161	161	37	37
Suburban	*	12		162		40
Small City	*	0				
Large Town	*	5		161.5		38
North	*	18		161.5		38
Northwest	*	3		152		16
South	*	11		159		32
Indianapolis	*	8		161.5		38

*The 1944-1945 study reported categories only in City, Township, and Special school types.

Metropolitan Achievement Tests Results

During the month of October 1986, the *Metropolitan Achievement Tests: Reading Survey*: (1986) (MAT) was administered to a sample of sixth and tenth graders throughout the state.[14] The sample of students who were administered the MAT constituted a 10% sample of those students who were administered the ISRT. This sample was, therefore, administered both the MAT and the ISRT and was chosen to represent at least a 1.0% sample of all sixth and tenth graders in the state. In actuality 1,010 sixth graders were included in the sample which constituted a sample of 1.4% and 931 tenth graders were included which constituted a sample of 1.1%.

The *Intermediate Level* of the test was administered to sixth graders and the *Advanced-2 Level* of the test was administered to tenth graders. Both tests include subtests of vocabulary and comprehension.

Sixth Grade Results

Sixth grade students scored above average when compared to the national norms for the MAT. Figure 14 provides a comparison of the *grade-equivalent* scores of sixth graders on vocabulary, comprehension, and total reading to the national norm expectation of 6.1 (first month of 6th grade).

[14] A description of the sampling procedures is described in Chapter 2.

Figures 15, 16, and 17 provide a comparison of the performance of sixth graders on vocabulary, comprehension, and total reading to the norm population at each quartile. If Indiana sixth graders performed *the same* as the national norm population, 25% of the students would have scored in each quartile. However, it is obvious from examining these three tables that fewer than the expected 25% of Indiana sixth graders scored in the lower quartiles and larger percentages scored in the higher quartiles.

Figure 18 provides data regarding the percentage of sixth graders at each *Instructional Reading Level*. This data shows the percentage of students in sixth grade who should be placed in instructional reading materials at each of the grade levels indicated. For example, 15% of the 6th graders could be placed in instructional reading materials at the 9th-10th grade level, and 2% of the sixth graders could be placed in instructional reading materials at the 3rd grade level.

Tenth-Grade Results

Tenth-grade students scored below average when compared to the national norms for the MAT. The expected grade equivalent score for the tenth graders was 10.1 (first month of 10th grade). The actual scores were 9.5 for Vocabulary, 9.9 for Comprehension, and 9.6 for the Total. Figure 19 provides a comparison of the actual performance of the 10th graders to the expected performance.

Figures 20, 21, and 22 provide a comparison of the performance of tenth-grade students on vocabulary, comprehension, and total reading to the norm population at each quartile. If Indiana tenth graders performed *the same* as the national norm population, 25% of the students would have scored at each quartile. On the Vocabulary test 57% of the students scored in the lower two quartiles and 43% scored in the upper two quartiles. On the Comprehension test the situation was reversed with only 44% scoring in the lower two quartiles while 56% scored in the upper two quartiles. Of the 56% who scored in the upper two quartiles, however, 32% scored in the third quartile and 24% scored in the fourth quartile. On the Total Reading score, the tenth graders had more than the national norms in the middle two quartiles and fewer than the national norms at the first and fourth quartiles.

Figure 23 provides data regarding the percentage of tenth graders at each *Instructional Reading Level*. This data shows the percentage of students in tenth grade who should be placed in instructional reading materials at each of the grade levels indicated. For example, 2% of the students could be placed in instructional reading materials at the 5th grade level and 24% of the students could be placed in instructional reading materials at the 11th grade (or higher) level.

Figure 14

Grade Equivalent Scores for 1986 Indiana Sixth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Intermediate Form L(1985)

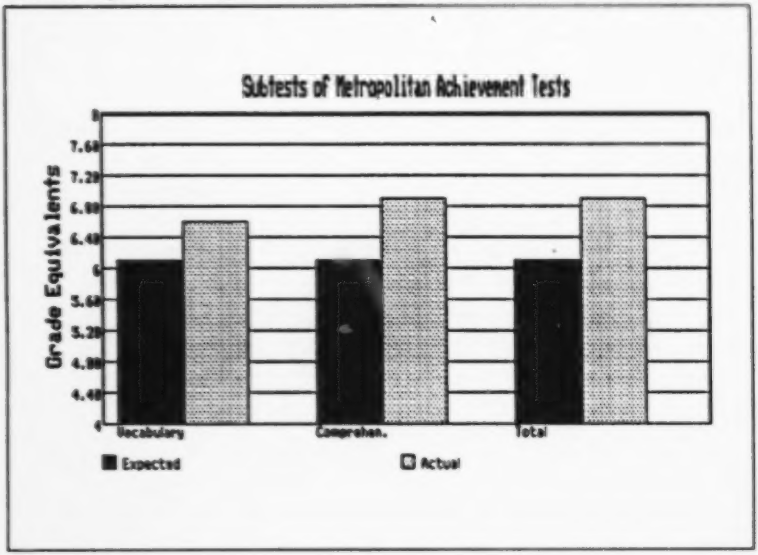


Figure 15

Vocabulary Performance by Quartiles for 1986 Indiana Sixth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Intermediate Form L (1985)

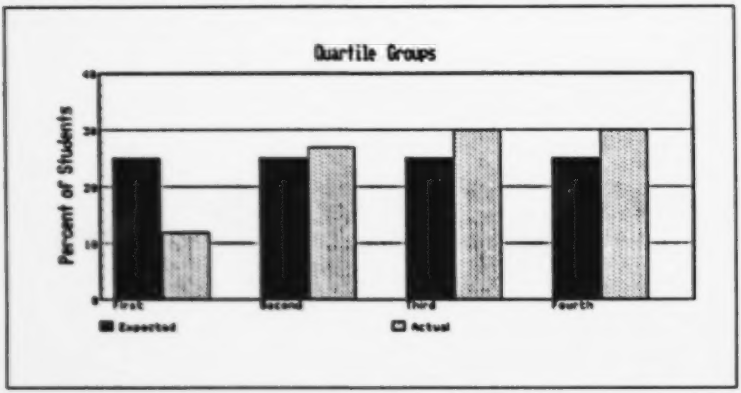


Figure 16

Comprehension Performance by Quartiles for 1986 Indiana Sixth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Intermediate Form L (1985)

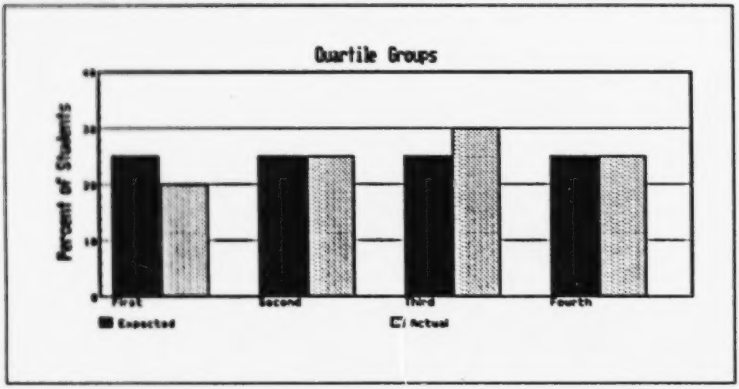


Figure 17

Total Reading Performance by Quartiles for 1986 Indiana Sixth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Intermediate Form L (1985)

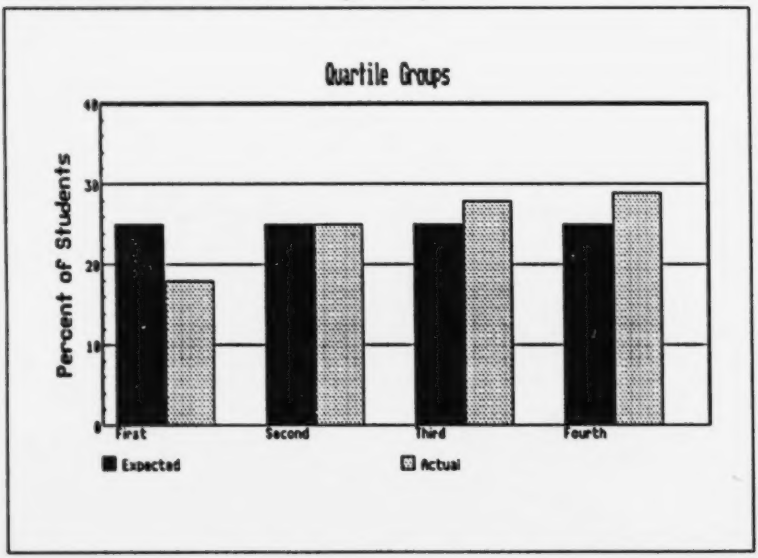


Figure 18

Instructional Reading Levels for 1986 Indiana Sixth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Intermediate Form L (1985)

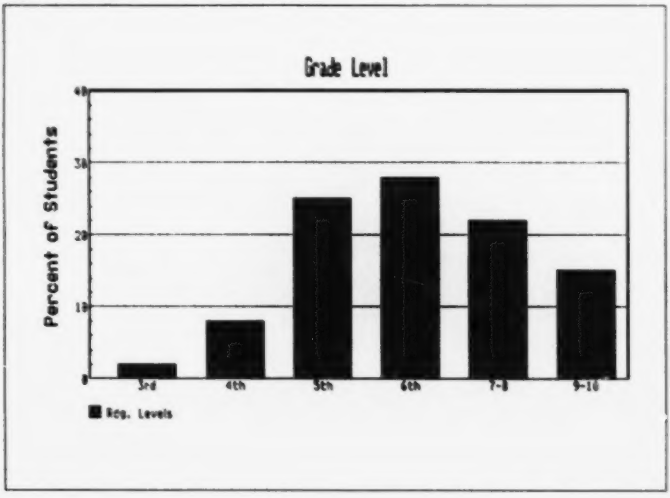


Figure 19

Grade Equivalent Scores for 1986 Indiana Tenth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Advanced 2 Form L (1985)

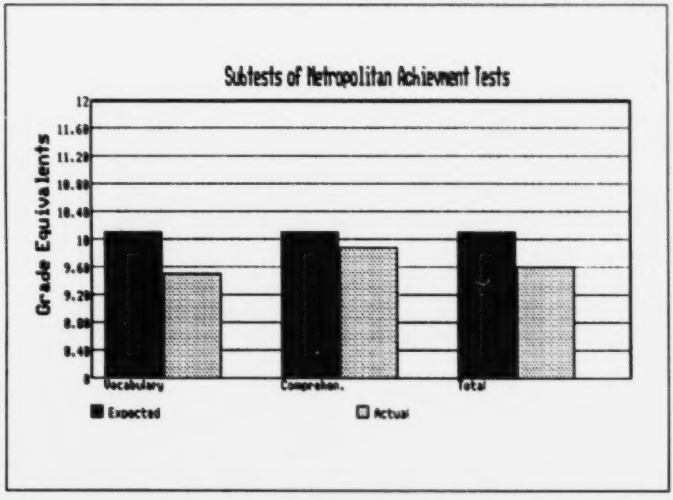


Figure 20

Vocabulary Performance by Quartiles for 1986 Indiana Tenth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Advanced 2 Form L (1985)

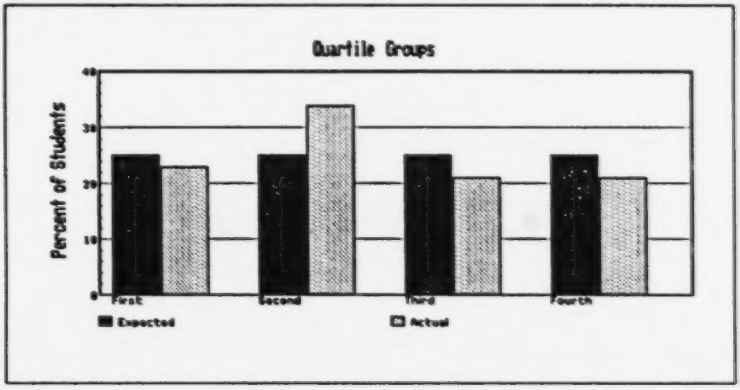


Figure 21

Comprehension Performance by Quartiles for 1986 Indiana Tenth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Advanced 2 Form L (1985)

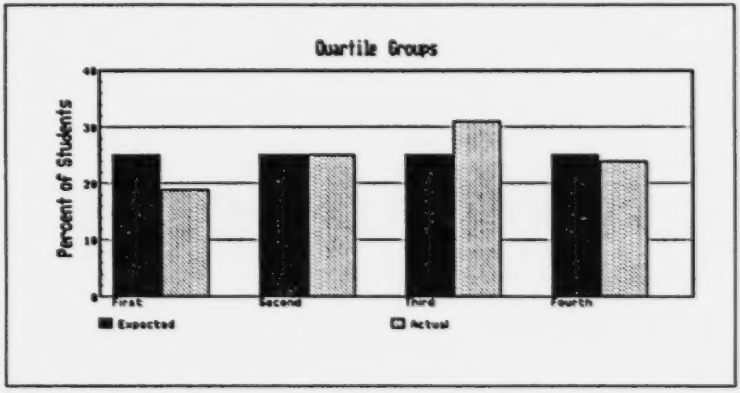


Figure 22

Total Reading Performance by Quartiles for 1986 Indiana Tenth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Advanced 2 Form L (1985)

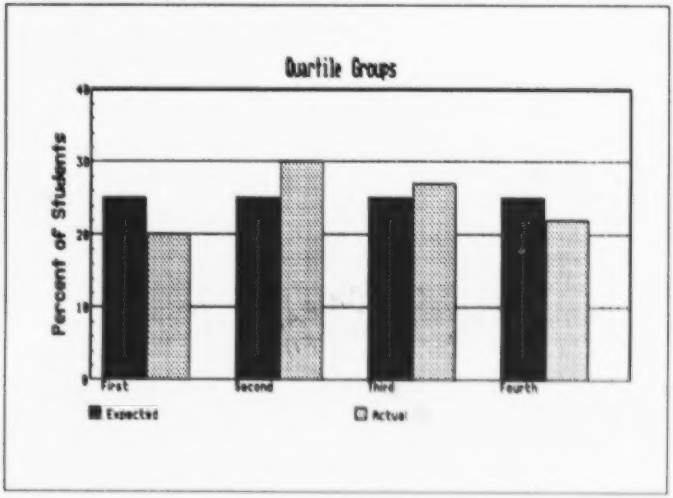
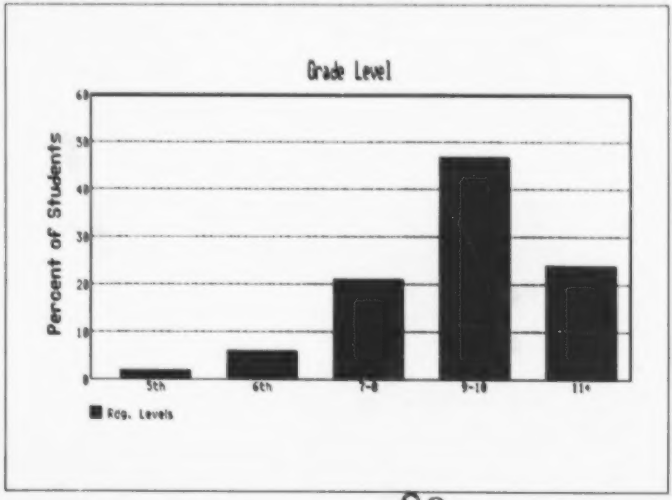


Figure 23

Instructional Reading Levels for 1986 Indiana Tenth Graders on the Metropolitan Achievement Tests: Reading Survey Tests-Advanced 2 Form L (1985)



CHAPTER 4

A CONTEXTUAL INTERPRETATION

Any interpretation of data from tests given in time periods as far apart as 1944-1945, 1976, and 1986 ought to consider the contexts in which the data was collected. "Any number of economic and societal factors will have affected the student population and will have made the attitudes, abilities, and backgrounds of students in the later time periods quite different from those of the students being studied years earlier" (Farr and Fay, 1982, p.86). To do this to appropriately weigh all the possible variables that could have affected the results would be a massive task, and any attempt at a definitive analysis lay beyond the scope of this study.

This chapter will discuss contextual factors in two areas: demographic and educational differences between 1944-1945, 1976, and 1986.[15] The effects that such differences might have had on students' performance on a standardized reading test are briefly considered in each section, with further consideration in Chapter 6.

Some contextual data was collected only for the 1986 sample and is, therefore, not matched with the earlier 1944-1945 and 1976 studies.

The Demographic Context

Indiana changed dramatically from 1944-1945 to 1986. The population grew, the focus of the economy shifted dramatically, and people moved from farms to cities. At the same time, a large influx of minorities people joined the state. These demographic shifts must be considered in any analysis of academic achievement trends. Specific conclusions regarding demographic characteristics are difficult to support. Those that seem plausible will be found in Chapter Six.

Population Growth

Indiana's population increased by 51% between 1940 and 1970, an average of 17% each decade, then slowed to a 5.7% growth rate in the 1970's. The state's population in the number of persons per square mile is shown in Figure 24 as increasing from 94.4 in 1940, to 146.3 in 1970, and to 152.8 in 1980. There are several reasons for this dramatic increase in population and its leveling off in the 1970's.

Indiana industries began attracting more persons to the state during the World War II years, and thus this increase in population was well underway when the 1944-1945 study was conducted. An indication of this growth, oddly enough, is found in the state's population drop of only one percent during the World War II years. This drop is based on "in-residence" citizens—so Indiana citizens away from the state in the armed forces were counted as a population loss. The one percent drop was only one-third of the drop experienced nationally, and it was equal in number to only one-fourth of the number of Hoosiers who went into the armed forces. Thus this drop actually indicates the beginning of an extended period when Indiana's industries were drawing new citizens into the state.

The recession of the 1970's reversed the industrial growth. An out-migration of industrial workers to the Sun Belt became the trend. The state's growth rate of 5.7% was lower than the number of children born in Indiana during the same time period; children under five equaled 7.9% of the state's population.

Population shifts. Population shifts within the state were also pronounced between the three time periods. An approximate 10% shift in population from rural to urban is documented between 1940 and 1970. The Bureau

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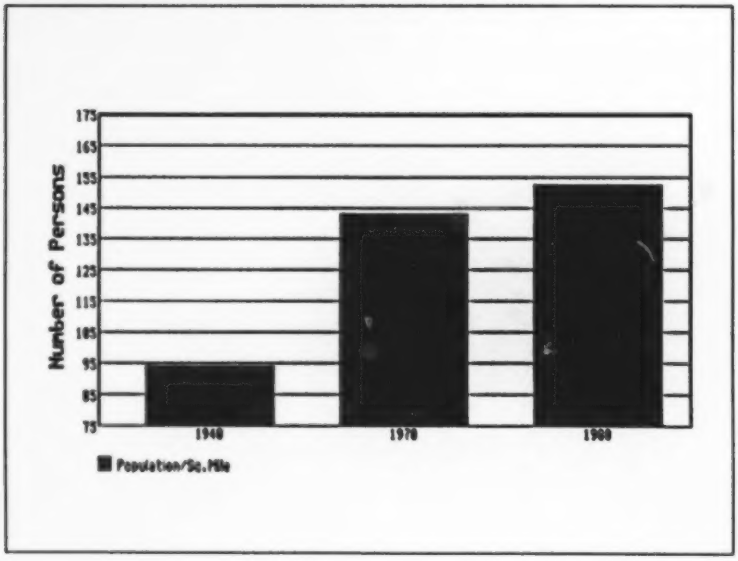
[15] The information for these contextual descriptions was provided by reports from the Indiana State Department of Education Information and Research Division, the 1981 Blomenberg dissertation comparing contextual variables in Indiana in 1944-1945 and 1976, the U.S. Bureau of the Census 1940, 1970, and 1980 reports, the three school surveys which accompanied this 1986 study (see appendix for survey copies), and other recent reports cited later.

Figure 24

Average Number of Indiana Citizens Per Square Mile of Land in 1940, 1970, and 1980



of Census figures show that the state's rural population decreased from 44.9% to 35.1% while the urban population increased from 55.1% to 64.9%. By 1980, urban populations in the state showed a growth of 4.5%, but dropped slightly to 64.2% of the state's total population. By 1980 rural population increased to 35.8% with a 7.9% growth since 1970.

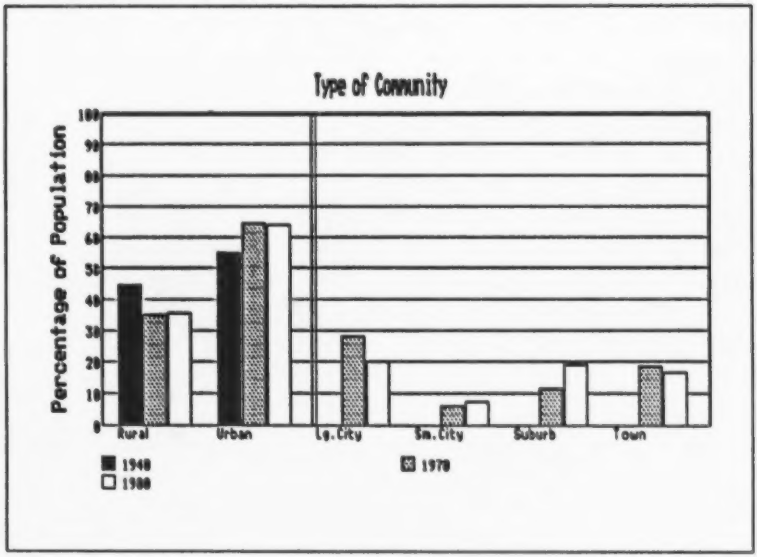
Shifts in population between 1970 and 1980, as shown in Figure 25, are evident when considering the percentage of communities of different sizes. Rural communities under 2,500 in population decreased slightly in number from 431 in 1940, to 394 in 1970, to 386 in 1980. The drop of 2% between 1970 and 1980 in the number of rural communities was accompanied by an increase in rural population statewide, suggesting that the very small communities with smaller schools disappeared or merged with nearby towns or small cities.

Towns with populations between 2,500 and 50,000 increased from 111 in 1970 to 119 in 1980, but decreased in population from 18.7% in 1970 to 16.8% in 1980. Small cities from 50,000 to 100,000 increased in number from six to eight between 1970 and 1980 with an increase in population from 6.2% to 7.8%. Suburbs, the largest population gainers, grew from 11.7% in 39 urban fringe areas in 1970, to 19.3% population of the state's population in 62 urban fringe areas in 1980.

However, urban areas of over 100,000 have decreased since 1970. The four large cities of 1940 increased to six large cities in 1970 composing 28.3%

Figure 25

Percentage of Indiana Population in 1940, 1970, and 1980 Living in Rural and Urban Locations, with Specific Percentages for the Urban Categories of Large Cities, Small Cities, Subrubs, and Towns



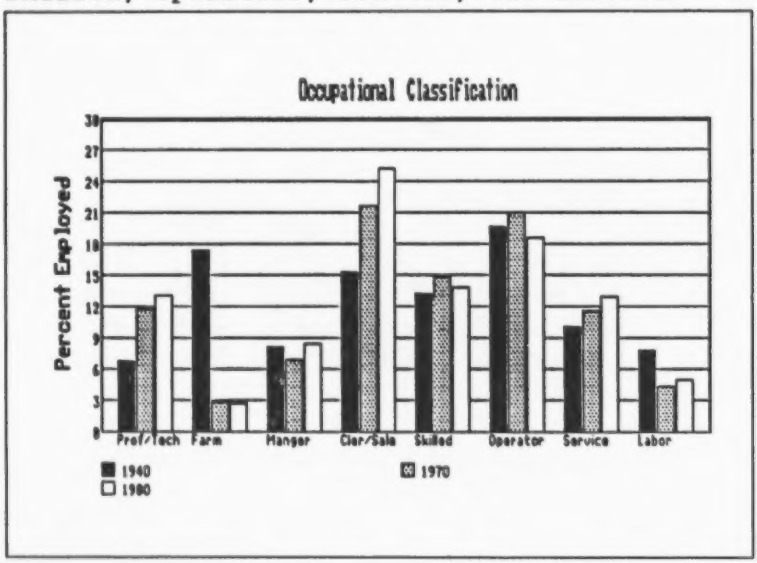
of the population. In 1980, the number of large cities in the state dropped to five with 20.3% of the state's population, an 8% decrease.

These shifts in population represent a decrease in the urban, and very small rural schooling areas, and a slight decrease in the size of schools in towns between 2,500 and 50,000 people. These decreases coupled with population increases in small cities and suburbs suggests medium size schools as a more common educational experience.

Ethnic distribution. The ethnic distribution of the Indiana population also changed markedly between 1940 and 1980. The number of Blacks and Hispanics nearly doubled between 1940 and 1970 from 3.6 to 7.2% of the population. In 1940, the 3.6% is characterized as Black. In 1970, the 7.2% non-white population was composed of 6.9% Black and .3% Hispanic. By 1980, that number increased another 2.7% to equal 9.7% of the state's population. The 9.7% non-white population in 1980 was composed of 7.5% Black, 1.6% Hispanic, .4% Asian, and .2% American Indian. Hispanics account for much of the change in the recent decade, suggesting an influx of spanish speaking citizens in Indiana. The school ethnic distribution discussed later in this report showed similar increases in size between 1940, 1970, and 1980.

Figure 26

Percentage of Indiana Working Force in 1940, 1970, and 1980 Employed in Occupation Classes: Professional, Farming, Managerial, Clerical, Skilled, Operators, Service, and Laborer



The Economic Context

Population shifts were accompanied by occupational shifts between 1944-45 and 1986 and a concern with unemployment became a factor between 1976 and 1986.[16]

Occupational shifts. As Figure 26 shows, the percentage of employed farmers decreased from 17.5% in 1940 to 2.9% in 1970 and 2.8% in 1980. This is an 84% drop within that occupation. Manufacturing occupations increased between 1940 and 1970, but dropped, by 1980. Craftsmen, foremen, operators, and kindred workers increased from 33% of employed workers in 1940 to 36% in 1970 but in 1980, dropped to 32.6%, a lower level than 1940. Laborer occupations dipped in 1970 to 4.4% but rose slightly to 5.0% in 1980, still below the 7.8% level of 1940. These employment changes parallel the rural and urban population shifts.

The percentage of professional occupations has steadily increased from 6.8% to 11.8% and 13.1% in 1980. Sales and clerical occupations have also risen constantly, from 15.3% in 1940 to 21.7% in 1970 and 25.2% in 1980. And

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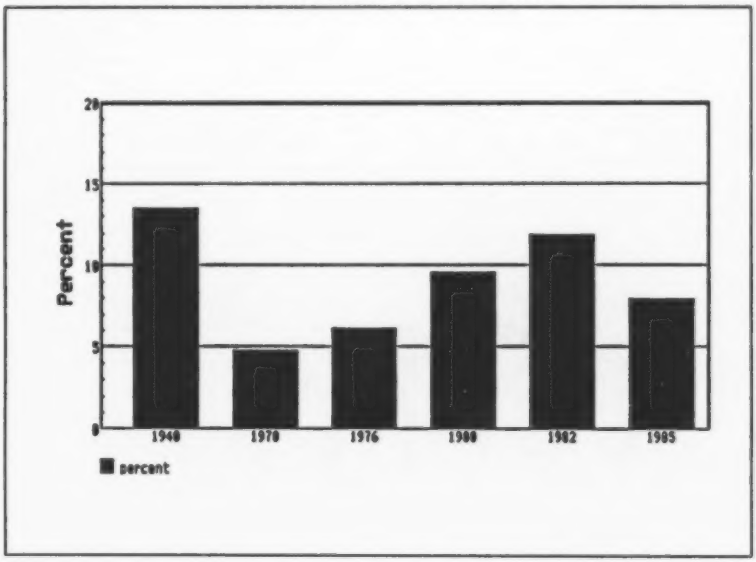
[16] Besides the U.S. Census reports of 1940, 1970, and 1980, economic information was provide by various reports from the Research and Statistics Section of the Indiana Employment Security Division (see Bibliography for complete citations of these reports).

Figure 27

Percentage of Indiana Working Force Unemployed in Various Years between 1940 and 1985



service occupations have likewise increased from 10.1% to 11.6% and 13% in 1980. Since 1970, managerial occupations have risen from 6.9% to 8.4%, slightly higher than the 1940 level of 8.2%.

Decreases in laboring and manufacturing occupations, coupled with increases in technical, professional, and service occupations, reinforce the suggestion that today's occupations require many more literacy skills than the work place of 40 and even 10 years ago. Also, students in 1980 homes of technical and professional workers might be more exposed to reading materials and place higher value on reading achievement.

Unemployment. Figure 27 shows unemployment at a high level of 13.5% in 1940. The prosperity of the 50's and 60's led to a lower unemployment rate of 4.8% in 1970. The 1976 unemployment rate was slightly higher at 6.1%. From 1980 to 1982 unemployment rates in Indiana climbed from 9.6% to 11.9%. By 1985, the unemployment rate had dropped to 7.9%. However, in 1985, more people were out of work in the dense urban and highly rural counties, and the statewide unemployment rate for non-whites was 16.4%.

The relationship between unemployment and school reading achievement scores in the three time periods is unknown. The high unemployment in 1940 had disappeared by in 1944-45 at the height of war production. With easy employment, the importance of reading to students for future employment success might be diminished. If it is known to be difficult to leave school and secure

a good-paying job, many students might see school and reading ability as important factors to their future livelihood. However, the view of students in the three time periods on the importance of reading for future employment success is unknown.

The Educational Context

General educational factors in Indiana are discussed first, then the specific context data relating to the schools in the three studies 1944-1945, 1976, and 1986 is summarized in four sections: 1) The School Context, 2) Sixth-Grade Classroom Context, 3) Tenth-Grade Classroom Context, and 4) Reading Curriculum Context.

Separate 1986 questionnaires were returned by 1) school administrators, 2) sixth-grade teachers, and 3) tenth-grade teachers.[17] Administrator questionnaires were returned by 154 of the 157 participating schools. All 117 sixth-grade schools and all 40 tenth-grade schools in the 1986 sample returned at least one teacher questionnaire. Of the 427 sixth-grade questionnaires mailed with the tests, 269, (63%) were returned. Of the 180 tenth-grade questionnaires, 110, (61%) were returned. For items dealing with school data, multiple teacher responses were averaged. The 269 sixth- and 110 tenth-grade teacher responses were compiled by grade level for factors dealing with teacher and class information; this procedure followed the same questionnaire summary procedure used in the 1976 study. When possible, comparisons to the 1944-1945 and 1976 time periods are made.

Indiana Educational Context

Years of school completed. The educational attainment of Indiana citizens age 25 and over rose steadily since 1940, when the median years completed was 7.5. By 1970 the median was 12.1 years completed and by 1980 the median was 12.4.

As shown in Figure 28, the percentage of citizens age 25 and over who have not attained a high school diploma has decreased from 74.3% in 1940, to 47.2% in 1970, and 34% in 1980. The percentage of citizens age 25 and over who attended college increased from 9% in 1940, to 16.9% in 1970, and to 24% in 1980. In 1980 the percentage of citizens aged 18 to 24 who graduated from high school was 75.7%. This is a dramatic change from 1940 when three of every four did not graduate, and from 1970 when almost two of every four did not graduate. The increased level of education in 1986 suggests a population with a higher level of literacy making reading ability more important in the homes of the 1986 sample.

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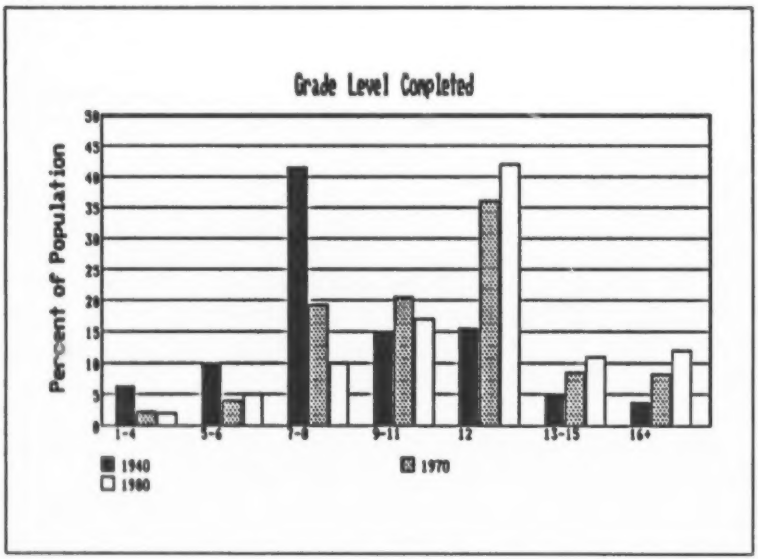
[17] Appendix A includes copies of these questionnaires.

Figure 28

Level of Education Attained by Indiana Citizens over the Age of 25 in 1940, 1970, and 1980



School dropout. The reasons for the alarming dropout rate in 1940 were studied by the Indiana Department of Public Instruction and reported in 1955 by Carnes:

> In December, 1943, Dr. C. T. Malan, State Superintendent, estimated that more than 18,000 students, or about one-tenth of the total high school enrollment, had given up classroom exercises in favor of military service or defense work. A survey conducted by this office showed that in the two years following the outbreak of the war, 2,975 boys had dropped out of school to join the service and that 8,025 had chosen to work rather than study. Almost as alarming was the fact that 7,456 girls had left school before finishing their secondary education. Although many of these girls were attracted by high paying positions in industry, others simply chose to marry high school classmates and travel with them from service training camp to camp in preference to staying at home and completing work for their high school diplomas.[18]

The above method of determining the dropout rates considers how many adults over age 25 could have graduated, but didn't. The Indiana Department of Education used this method in a recent study, calculating the dropout rate

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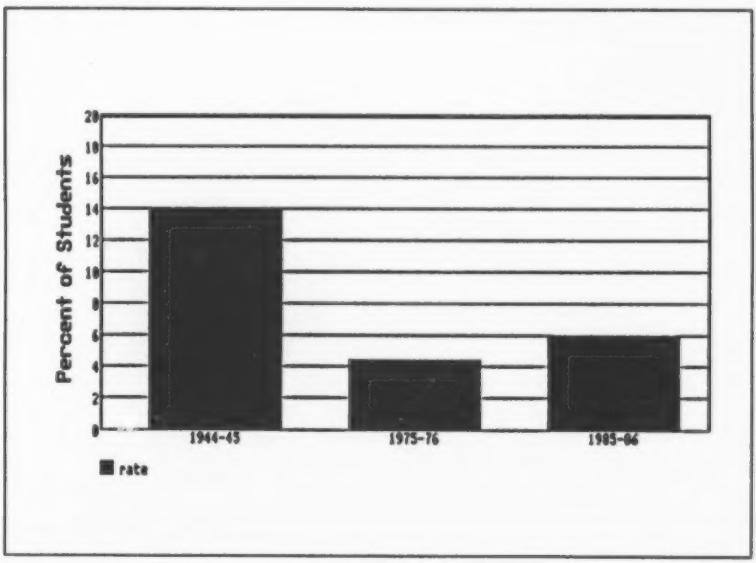
[18] Carnes, Max Parvin. *The Hoosier community at war*. Unpublished doctoral dissertation, Department of History, Indiana University, Bloomington, Indiana, 1955, pp. 599-660.

for 1976 high school freshmen who never graduated at 23.5%. (Beymer, Hill, and Osmon, 1987, p. 6). For 1982 freshmen, who were to graduate in 1986, the dropout rate was 22%, a slight decrease from 1976. The 1940 dropout rate using this method was estimated at 75%.

However, there is another method of calculating the dropout rate for the population of tenth graders who were the samples for the three studies. This method compares the number of ninth graders the previous year who did not enroll in tenth grade the next year, the dropout rate for just a one year period. As Figure 29 shows, the population of tenth graders in 1940 decreased 14% from the previous year's ninth-grade enrollment. In 1976, the tenth-grade enrollment was 4.4% less than the previous year's ninth-grade enrollment. In 1986, the tenth-grade enrollment was 6.0% less than the previous year's ninth-grade enrollment. Therefore, the dropout rate for students involved in the Then and Now studies sharply declined between 1940 and 1976, but increased slightly in 1986.

Figure 29

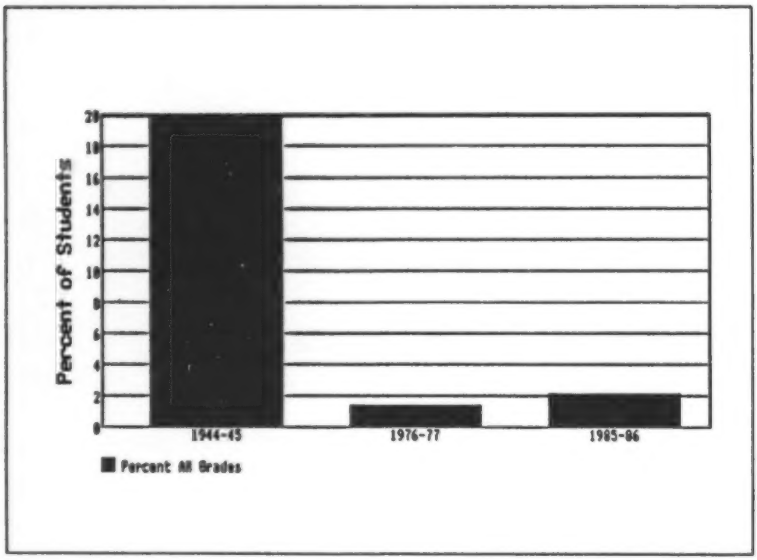
Dropout Rates for Indiana Tenth Grade Based on One Year Enrollment Decreases between Ninth and Tenth Grades in 1944-1945, 1975-1976, and 1985-1986



These dropout rates are very important variables in assessing reading achievement. Assuming students who drop out of school are not among the strongest performers on a reading achievement test, low dropout rates would include test scores that would tend to lower the performance average for the

Figure 30

Indiana Students Retained in Grades 1-12 in 1944-1945, 1976-1977, and 1985-1986



entire population. The higher dropout rate during the 1944-45 testing suggests fewer scorers at the lower end in the test data. The lower dropout rate in 1986 suggests a greater number of students with low test scores, which in turn would cause a lower overall performance for the entire sample population.

School retention and pupil age. Lower retention rates, shown in Figure 30, and younger students in 1986, shown in Figure 31, are factors in the amount of school experience a student would bring to the reading test in the three time periods.

The 20% retention rate in 1940 was most likely the reason for the older age of sixth graders, an average of 12 years and 4 months. Social promotion had become the norm by 1970, when the retention rate was 1.4% and the average sixth grader was 11 years and 6 months. Social promotion extended into 1980, when the rate of grade retention remained a low 2.1% and the average sixth grader was still 11 years and 6 months of age.

In the high school, the average age of students in tenth grade dropped from 16 years and 7 months in 1940, to 15 years and 5 months in 1970, and to 15 years and 2 months in 1980.

Older students would seem to have an advantage over younger students in reading ability, which correlates highly with the amount of reading experiences. The vastly younger tenth-grade students in the 1986 Then and Now study had almost a year to a year-and-a-half less reading experience, making

a lower score on a reading achievement test for the 1986 sample more probable.[19]

School ethnic distribution. The ethnic distribution of students in the actual testing samples of 1944-1945 and 1976 was not gathered. Instead, census and state department of education data were used to establish the ethnic distribution shown in Figure 32.

Census figures show that 11% of the school population in 1970 was non-white, while in 1940 it was only 4%. In 1986, Department of Education figures show that 13% of the school population was non-white with 10.3% Black, 1.7% Spanish heritage, and the remaining 1% American Indian or Asian. The 2% increase in non-white students since 1970 was proportionately distributed between the schools. Different ethnical backgrounds in 1970 and 1980 contained a higher concentration of non-white students than the state as a whole. The group of students who took the *ISRT* in 1976 and 1986 had an ethnic make-up very different from that of 1944-1945, suggesting an advantage for the 1944-1945 students who more closely represented the norming population of the original test.

The School Context

The educational factors discussed in this section relate directly to the sample schools in the 1944-1945, 1976, and 1986 studies. Most of the 1986 data in this section was gained from the Administrator Survey. Some data was determined from other Department of Education sources. Information from 1986 is compared with 1944-1945 and 1976 on the following school educational aspects: 1) length of school year, 2) school system organization, 3) number of elementary classrooms in a building, 4) size of sixth- and tenth-grade enrollments in the school, and 5) years of teacher experience (reported on teacher questionnaires). Other data gathered only in 1986 is also reported: 1) school special reading assistance programs, 2) percent of non-English speaking homes, 3) school ethnic distribution, 4) and percent of families receiving public assistance.

Length of school year. The length of the school year has fluctuated between 1944-45, 1976, and 1986, and the same pattern holds for both sixth and tenth grades. However, a clear look at the differences between the three time periods is clouded by the data collection. The 1944-1945 survey requested the length of the school year in number of months and fractions of months. The 1976 and 1986 survey requested the length of the school year in number of school days. Neither survey asked the schools to distinguish between teacher days and student days in terms of the length of the school year. The relationship between school days and months used in this report is approximate; it was determined by considering school calendars which distribute a 180 day school year over a calendar time of 9 months and one week. Considering one week to equal 1/4 of a month, a 180 day school year would be equal to 9 and 1/4 months. The remaining month equivalents were determined by adding or subtracting five school days in either direction.

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[19] The average age of sixth and tenth grade students was calculated using the U.S. Census reports for 1940, 1970, and 1980 where the number of students enrolled in each grade level broken down by age.

Figure 31

Average Age of Indiana Sixth and Tenth Graders in 1940, 1970, and 1980

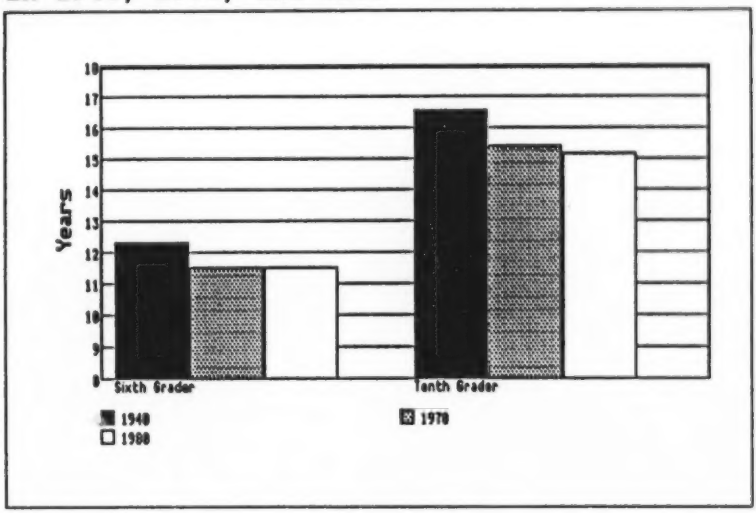


Figure 32

Ethnic Distribution of Indiana Pupils for Grades K-12 in 1944-1945, 1976-1977, and 1985-1986

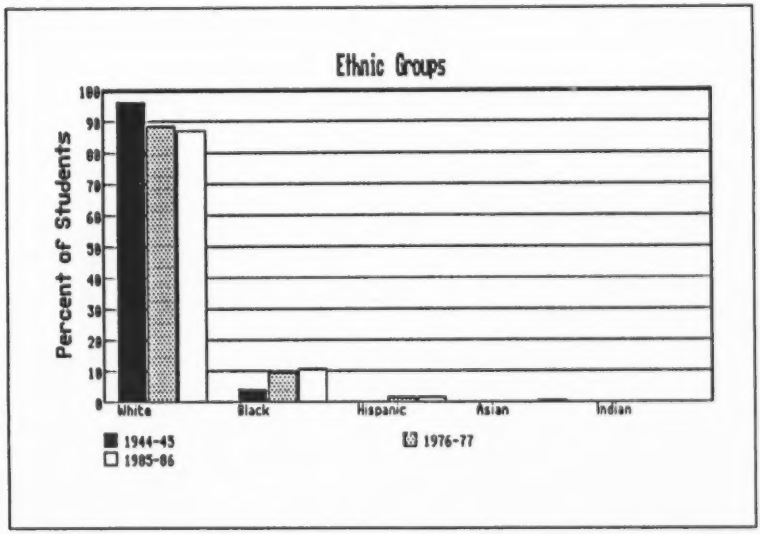


Figure 33

Average Length of the School Year for the Sample Schools in the 1944-1945, 1976, and 1986 Indiana Then and Now Studies

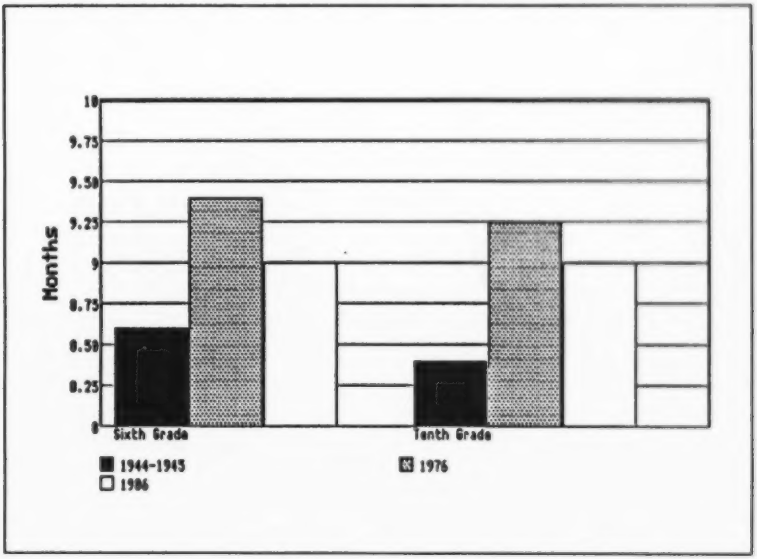


Figure 33 shows the average school year for sixth grade in 1944-1945 as 8.6 months; it increased to 9.4 months by 1976, and then decreased in 1986 to 9.0 months. None of the 1976 or 1986 schools reported a school year less than nine months or 175 days. For tenth grade, the average year in 1944-1945 was 8.4 months; it increased to 9.25 months by 1976, and then decreased in 1986 to 9.0 months.

Table 12 presents the length of the school year as reported by the schools in the 1944-1945, 1976, and 1986 samples. The 1976 sample was only partially reported, with 30 of the 31 schools having a school year between 175 and 185 days, 9 to 9 1/2 months. In 1986, no schools reported less than 175 school days or more than 180 school days.

No clear evidence of a link between length of the school year and performance on the ISRT is supported by this fluctuation. The 1944-1945 report concluded that the length of the school year did not relate significantly to performance. The 1976 report concluded that if school year length did relate to performance, then the longer school year in 1976 would have given the advantage to those students. The shorter school year in 1986 would suggest those students to be at a disadvantage to the 1976 students, but still better off than the 1944-1945 students. The 1986 sixth graders, attending the middle school length of the three studies, out-performed both the shorter and longer

Table 12

Length of School Year (in Months) in Indiana for Sixth and Tenth Graders in 1945, 1976, and 1986.

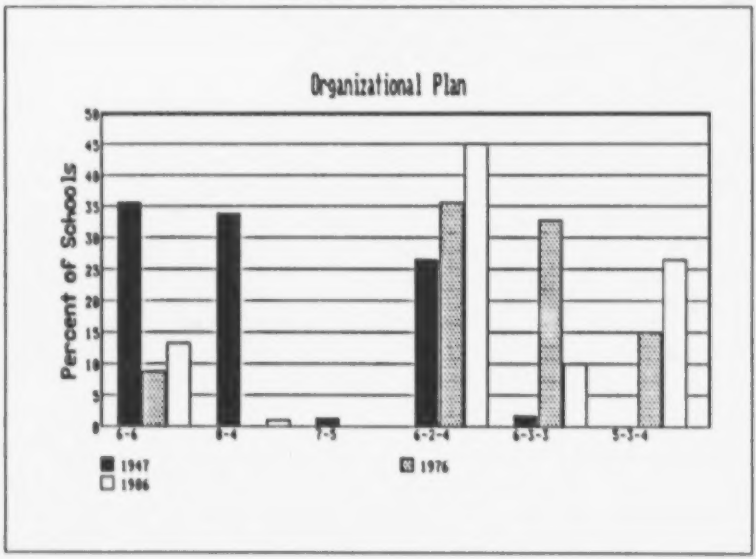
		SIXTH GRADE						TENTH GRADE					
		1945		1976		1986		1945		1976		1986	
Days	Months	#	%	#	%	#	%	#	%	#	%	#	%
155	8	373	51.0	0	0.0	0	0.0	142	59.0	0	0.0	0	0.0
165	81/2	4	.5	0	0.0	0	0.0	6	3.0	0	0.0	0	0.0
175	9	260	35.6	3	1.2	102	87.0	75	31.0	?	?	27	68.0
180	91/4	13	1.8	109	44.5	14	12.0	1	0.4	13	43.0	13	33.0
185	91/2	52	7.1	113	46.0	1	1.0	5	2.0	?	?	0	0.0
195	10	29	4.0	26	8.1	0	0.0	11	5.0	0	0.0	0	0.0
Total # of schools=		648		117		117		243		30		40	
average=		8.6 mo.		9.4 mo.		9.0 mo.		8.4 mo.		9.25 mo.		9.0 mo.	

school year students; this holds even with an adjustment for the 10 month younger student in 1976 and 1986. At tenth grade, even with age adjustments for progressively younger students in 1976 and 1986, the longer school year students in 1976 are equaled, and in 1986 outscored, by the shorter school year students from 1944-1945. These findings are not independent from other contextual factors which make up the school experience; hence, conclusions one way or another concerning a connection between length of the school year and reading achievement are not possible.

School System Organization. The number of public schools in Indiana steadily declined from 2,764 in 1944-45, to 2,149 in 1975-76, and to 1,854 in 1985-86. Figure 34 and the data in Table 13 show that the plan of organization in grade divisions also shifted in the three time periods.

Figure 34

Organizational Plans Used by the Public School Systems in the 1947 ISSC Study and the 1976 and 1986 Indiana Then and Now Studies



A 1947 statewide survey concluded that the common township organization was the 6-6 plan and the common city school organization was the 8-4 plan. (ISSC, 1949, p. 358). The Indiana Then and Now study in 1976 found 91.2% of the sample schools using an organizational plan that created a junior high school. Of that percentage 68.4% had school system organizations that maintained a K-6 unit and either a 7-8 grade combination with a four-year high school, or a 7-9 grade combination with a three-year high school. Fifteen percent of the schools in 1976 had moved to the middle school concept with an organizational plan including a 6-8 grade unit.

The middle school concept was more popular by 1986, when the percentage of schools with a 6-8 grade unit had increased by 11.7% to 26.7%, almost double that of 1976. Coupled with an increase in 1986 plans that favored four-year high schools, the number of schools with junior high grades 7-9 decreased sharply from 32.8% to 10.1%.

Overall, the school organization plan that gained momentum during each time period was the 6-2-4 plan, increasing from 26.6% in 1947, to 35.6% in 1976, and to 45.2% in 1986. The possible influence of these school organization plans on reading achievement is difficult to ascertain, but formal reading instruction traditionally ends when students enter a more departmentalized junior high or middle school. If reading instruction ended sooner in the last decade, then the cumulative effects upon the reading performance of tenth graders might make lower scores more probable.

Table 13

School System Organization in Indiana Public Schools in 1944-1945, 1976, and 1986.

	1944-1945		1976		1986	
Plan Type	#	%	#	%	#	%
6-6	279	35.6	13	8.9	21	13.3
8-4	266	33.9	0	0.0	0	0.0
7-5	10	1.3	0	0.0	0	0.0
6-2-4	208	26.6	52	35.6	71	45.2
6-3-3	14	1.8	48	32.8	16	10.1
5-3-4	0	0.0	22	15.0	42	26.7
other	6	.8	11	7.5	5	3.1
Schools=	783		146		157	

Number of Elementary Classrooms in the Building. Schools in the 1976 and 1986 studies reported nearly three times as many classrooms in the elementary building as were reported in the 1944-1945 study. In the 1944-1945 study, 79 one-room schools responded; this dropped to only one in the 1976 study and in 1986, none of the schools had less than four classrooms in the building. Table 14 shows the majority of schools in 1944-1945 reported less than 10 classrooms. In 1976 and 1986 the majority of schools reported more than 10 classrooms. However, a shift towards smaller schools between 1976 and 1986 is evidenced by the decreasing percentage of schools with 16 or more classrooms and the increasing percentage of schools with 11-15 classrooms. This growth of medium sized schools from 25.1% in 1976 to 34.1% in 1986 parallels population shifts away from small rural and large urban areas to towns and suburbs.

The impact of this change in the size of schools on reading achievement gains in the sixth grade is unknown. The 1944-1945 study using the ISRT did not find the number of classrooms to be a significant factor. A 1944 Indiana Department of Public Instruction study found the impact of this factor, mixed with higher achievement generally related to multiple room schools.[20] A recent

[20] State of Indiana Department of Public Instruction. *An analysis of factors related to the language arts achievement of sixth grade pupils.* Indianapolis: Author, Research Bulletin No. 8, 1944.

Table 14

Number of Elementary Classrooms in the Building for Indiana Sixth Grades, 1944-1945, 1976, and 1986.

	1944-1945		1976		1986	
Number of Classrooms	# of Schools	% of Schools	# of Schools	% of Schools	# of Schools	% of Schools
1	79	11.4	1	.4	0	0.0
2	85	12.3	2	.8	0	0.0
3	101	14.6	8	3.4	0	0.0
4	83	12.0	2	.8	1	.8
5	40	5.8	3	1.3	1	.8
6	89	12.9	12	5.0	6	5.1
7	36	5.2	2	.8	5	4.2
8	73	10.6	6	2.5	7	5.9
9	25	3.6	19	8.0	6	5.1
10	79	11.4	13	5.5	7	5.9
11-15*	0		63	26.5	40	34.1
16-19*	0		63	26.5	29	24.7
20+	0		44	18.5	15	12.8
Average	4.9 classrooms		12 classrooms		13.5 classrooms	

*In averaging, the figures for gradation on this and other tables in this section that span more than one increment are figured at the median figure, at the top figure for lowest spans, and at the bottom figure for top spans.

study by Gregory and Smith (1987) suggests that smaller schools improve achievement by making possible a greater sense of social community which larger schools cannot attain. The medium size schools which seem evident in 1986 may be a contributing factor in the higher reading achievement of sixth graders.

Size of sixth-grade enrollments. Table 15 shows the growth in school enrollment between 1944-1945 and 1976, and the slight decrease in the last decade. In 1944-1945, 72% of the schools reported only one to 25 students enrolled in sixth grade. No schools reported an enrollment larger than 55. By 1976, the bulk of schools, 62%, started at 55 students and ranged up to 125 students enrolled in sixth grade. None of the 1976 schools reported less than 16 students, whereas half the schools in 1944-1945 reported that number. The 1986 enrollments decreased, as 68% of the schools reported between 31 and 100 students enrolled in sixth grade. However, the most common enrollment size in 1976 and 1986 remained the same, 76 to 100 students. Also, 1986 schools showed a slight increase in the number of schools with large enrollments over 151 students, up 2% from 1976. So in 1986, although the middle sized enrollment of 76 to 100 students remained the most common and a few schools showed enrollment growths, about half became slightly smaller.

Size of tenth-grade enrollments. Of the forty schools in the 1986 sample, 25% reported enrollments between 50 and 100 students, 30% reported a tenth-grade enrollment of between 100 and 200 students, and 25% reported enrollments between 200 and 300 students. Ten percent had tenth-grade en-

Table 15

Number of Sixth Graders in the School for Indiana Schools in 1944-1945, 1976, and 1986

	1944-1945		1976		1986	
Number of Students	# of Schools	% of Schools	# of Schools	% of Schools	# of Schools	% of Schools
1- 5	96	13.0				
6-10	123	16.8			1	.8
11-15	120	16.4			1	.8
16-20	101	13.8	1	.9	4	3.4
21-25	88	12.0	6	4.6	3	2.5
26-30	69	9.4	5	3.9	4	3.4
31-35	56	7.7	3	2.3	8	6.8
36-40	27	3.7	8	6.2	9	7.7
41-45	17	2.3	9	7.0	13	11.1
46-50	13	1.8	9	7.0	1	.8
51-55	21	2.9	9	7.0	9	7.7
56-65			16	12.0	15	12.8
66-75			5	3.9	6	5.1
76-100			28	21.7	19	16.2
101-125			13	9.9	5	4.2
125-150			4	3.1	5	4.2
151-175			5	3.9	6	5.1
176-200			1	0.9	4	3.4
200-300			4	3.1	3	2.5
300+			3	2.3	1	.8

rollments between 300 and 400 and 7.5% had over 400 tenth graders. Only one school had less than 50 tenth graders enrolled. The size of tenth-grade enrollments at the sample schools in 1976 was not reported and not gathered in 1944-1945. The 1986 enrollments indicate large school student bodies for nearly 75% of the tenth graders. These large student populations at the high school level may have some impact on reading instruction and achievement.

Years of teaching experience. Table 16 presents the years of teaching experience in 1947, 1976 and 1986. The closest survey of teaching experience to the 1944-1945 sample was 1947, and some caution should be taken because the World War II would have made a different teacher population in 1944. Also, the 1947 survey covered all grade levels and used a different grouping of years; this grouping is reported in parentheses in the 1947 time period. (Blomenberg, 1980) The 1976 and 1986 studies have the same groupings of years of experience for both sixth- and tenth-grade teachers in the sample schools.

Teachers in 1947 and 1986 tended to have more teaching experience than teachers in 1976. Almost half of the 1947 teachers, 48.4%, had taught more than 17 years. In 1986, 45.7% of the sixth-grade teachers and 58.1% of the tenth-grade teachers had 16 years or more experience. Only 22% of sixth-grade teachers and 30.6% of tenth-grade teachers had more than 16 years experience in 1976.

The older staff in 1986 suggests more experience teaching reading in the elementary grades which might benefit the sixth graders of 1986 and 1944-1945. However, an older staff of language arts teachers at the tenth-grade level

Table 16

Years of Teaching Experience in Indiana Sixth and Tenth Grades in 1947, 1976, and 1986.

		SIXTH						TENTH			
		1947		1976		1986		1976		1986	
Years Experience		f	%	f	%	f	%	f	%	f	%
1-3	(1-4)	123	10.8	48	19.5	29	10.7	19	17.6	9	8.1
4-6	(5-8)	132	11.1	46	18.7	16	5.9	13	12.0	1	.9
7-9				39	15.9	29	10.7	17	15.7	5	4.5
10-12	(9-12)	187	15.8	37	15.0	32	11.9	12	11.1	15	13.6
13-15	(13-16)	169	14.3	22	8.9	40	14.8	14	13.0	16	14.5
16-18	(17-20)	19	10.0	12	4.9	4	17.1	8	7.4	27	24.5
19 or more	(21+)	445	38.4	42	17.1	77	28.6	25	23.2	37	33.6
Total		1,185		246		269		108		110	

in 1986—72.6% had more than 13 years experience may mean less pre-service or in-service course work related to teaching reading in content subject areas, this pre-service reading methods course was not required for certification of high school teachers until the 1980's. Teacher knowledge of content area reading skills instruction was unlikely in any of the three time periods.

School special reading assistance programs. Neither the 1944-1945 nor 1976 study gathered data on any special reading assistance programs. The 1986 survey asked how special reading instruction assistance was rendered: classroom tutors, remedial reading/Chapter I programs, learning disability program, or special instruction in the regular class. Many schools responded with more than one type of special reading assistance. As Table 17 shows, nearly three-fourths of the schools at the sixth-grade level had remedial reading and learning disability programs and about one-fifth of the schools provided tutors or special instruction in the regular classroom. At tenth grade, the assistance in the form of remedial reading programs decreased by 20%. Learning disability programs and special instruction in the regular class remained at the same levels. However, tutors in the classroom were rare. Overall, less individual assistance in reading is offered at the tenth-grade level.

Non-English speaking homes. Only the 1986 study collected the percentage of pupils in the school who spoke a language other than English outside of school or come from homes in which a langauge other than English is spoken most of the time. An average of 1.3% of the pupils spoke another language at home. Seven schools reported from 10 to 50% of their pupils with a first language other than English. The 1940 *ISRT* might be especially difficult for non-native English speakers, but comparison of this factor with previous time periods is impossible.

Percent of families receiving public assistance. This data was also collected only from the sample schools in the 1986 study. An average of 18.9% of the families in the schools taking the *ISRT* received public assistance such as Aid to Families with Dependent Children, food stamps, and social security. In 1986, 28.3% of the schools reported that at least 25% of their pupil families received public assistance; 29.5% reported that less than 10% of the pupil families received public assistance.

Table 17

Special Reading Assistance Programs for Indiana Sixth and Tenth Grades in 1986.

Reading Assistance Program	SIXTH #	SIXTH %	TENTH #	TENTH %
Tutors in classroom	23	19.6	4	2.5
Remedial/Chapter I	82	70.0	20	50.0
Learning Disabilities	92	78.6	33	82.5
Special instruction in regular classroom	24	20.5	9	22.5
Total*	221		66	

*The total number of schools adds up to more than the 117 sixth and 40 tenth grade schools surveyed because of multiple responses from schools with several reading assistance programs.

Sixth-Grade Classroom Context

Several classroom context questions on the 1986 sixth-grade survey had also been asked of teachers and principals in the 1976 and 1944-1945 surveys, thus providing comparative data for the following aspects of the classroom reading instructional context: 1) average class size, 2) number of grades in one classroom, 3) number of class minutes given weekly to reading instruction, and 4) whether reading was taught as a separate subject or with other content areas. The 1986 questionnaire also asked if groups of mixed abilities or if ability grouping and departmentalization was used to organize reading instruction.

Average class size. Table 18 shows the average class sizes reported by teachers in 1947, 1976, and 1986.[21] In 1947, 26% of the tenth grade teachers reported classes with 41 students or more and 69% reported class sizes between 31 and 50 students. These large class sizes decreased by 1976 when 53% of the teachers reported classes with 26 to 30 students; 87% reported class sizes between 21 and 30. There were few classes over 30 students in 1976—9%—and by 1986 there were none. In 1986, 65% of the teachers reported classes 21 to 25 students of as the smallest class size. Classes smaller than 20 students increased from 3% in 1947 and 1976 to 13% in 1986. Smaller class sizes in 1986 might favor 1986 reading achievement by allowing the teacher to provide more individual attention during reading instruction.

Number of grades in classroom. Table 19 shows that only 27% of the 1944-1945 schools had just one grade per classroom. By 1976, 93.5% had only one grade per classroom and this declined only slightly to 90% in 1986.

A 1944 report by the Indiana Department of Public Instruction found that "in general, high achievement is most closely related to schools of 5 to 21 rooms." (State Department of Public Instruction, 1944, pp. 73-74) Such schools would be less likely to mix grades in one classroom.

Number of class minutes given weekly to reading instruction. The number of class minutes given to reading instruction in 1986 remained at the

[21] The 1947 average class size was the closest to the 1944-1945 reading achievement study. The 1947 study included 794 elementary teachers.

Table 18

Average Class Size in Indiana Sixth Grades in 1947, 1976, and 1986.

Class Size	1947 #	1947 %	1976 #	1976 %	1986 #	1986 %
below 20	26	3.3	4	3.5	36	13.3
21-25	69	8.7	39	33.9	174	64.6
26-30	116	14.6	61	53.0	59	21.9
31-35	193	24.3	10	8.7	0	
36-40	181	22.8	1	.8	0	
41-50	174	21.9	0		0	
51-60	18	2.3	0		0	
60 or more	17	2.1	0		0	
Total	794		115		269	

Table 19

Number of Grades in one Classroom for Indiana Sixth Grades, 1944-1945, 1976, and 1986

Number of Grades	1944-1945 # of Classes	1944-1945 % of Classes	1976 # of Classes	1976 % of Classes	1986 # of Classes	1986 % of Classes
1	197	27.6	229	93.5	243	90.3
2	301	42.2	14	5.7	16	5.9
3	68	9.5	2	.8	9	3.3
4	70	9.8			1	.3
5	9	1.3				
6	5	.7				
7	4	.6				
8	58	8.1				
Total:	712		245		269	
Average:	2.5 grades		1.08 grades		1.14 grades	

1976 level. Table 20 shows that 86% of the teachers who responded in the 1944-1945 survey reported teaching reading less than 250 minutes per week or 50 minutes per day. The 1944-1945 average of 37 minutes per day was far below the 1976 average of 58 minutes per day and the 1986 average of 55 minutes per day. In 1976, 62.1% of the teachers, and in 1986, 49.1% reported teaching reading more than 255 minutes per week. This trend towards longer instructional time for reading would seem to provide an advantage to the 1976 and 1986 sixth graders.

Reading taught as a separate subject or combined with content area instruction. In the 1944-1945 survey, this question was phrased to ask if reading was taught with social studies. The rephrasing to include all content

Table 20

Number of Class Minutes Given Daily and Weekly to Teaching Reading in Indiana Sixth Grades 1944-1945, 1976, and 1986

Minutes Daily-Weekly	1944-1945 # of Classes	1944-1945 % of Classes	1976 # of Classes	1976 % of Classes	1986 # of Classes	1986 % of Classes
15 Up to 90	115	16.6	0	0	17	6.3
30 91-175	181	26.1	9	4.7	9	3.3
45 176-254	304	43.9	62	33.2	110	41.0
60 255-354	80	11.5	71	38.0	95	35.4
75 355-374	4	.5	6	3.2	5	1.8
75+ 375+	7	1.0	39	20.8	32	11.9
Total:	691		187		268	
Averages:	184 minutes 37 min/day		283 minutes 58 min/day		273 minutes 55 min/day	

areas in the 1976 and 1986 surveys may be a factor in the increased number of teachers who responded to teaching reading combined with content area instruction. Another probable explanation is the contemporary emphasis placed on making reading "real" or "whole" by teaching it as children actually use reading to learn content information. The 78% of 1986 teachers who combine reading with content area instruction was almost identical to the 76% in 1976. By combining reading instruction with other instruction during the last decade, students may have applied reading skills in a broader context of material, giving them an advantage over their earlier counterparts on reading achievement tests.

Grouping for reading instruction. Instructional grouping was not surveyed in 1944-1945 or 1976. Two questions on the 1986 questionnaire dealt with the school practice of departmentalizing instruction at the sixth-grade level and with ability grouping or mixed ability reading instruction. Of the 117 schools in the 1986 survey, 47 schools or 40% departmentalize for reading instruction. The question on ability grouping was not linked to departmentalization, but it is likely that students would be grouped by ability and move to the room of the teacher who instructed them at their reading level. For the entire sample of 117 schools, 94 schools—or 80%—reported grouping by ability for reading instruction. The 1944-1945 classroom context was probably closer to homogenous ability grouping, with students from various grade levels and in different readers working at their own ability level. The ability grouping which predominates in the 1986 sample might involve smaller groups of students having more interaction than earlier time periods. The 20% who reported using mixed ability grouping might teach the whole class at one time, which would not allow as much interaction between students or as much individual reading instruction from the teacher. The impact of ability grouping on reading achievement in this study is unknown.

Table 21

Reading Taught as a Separate Subject or Combined with Content Area Instruction in Indiana Sixth Grades in 1944-1945, 1976, and 1986

	1944-1945		1976		1986	
	# of Classes	% of Classes	# of Classes	% of Classes	# of Classes	% of Classes
Separate Subject	684	44.5	59	24.2	60	22.4
With Content (Social Studies)*	282	18.3	5	2.0	208	77.6
Both	571	37.2	180	73.8	(not asked)	

* The 1976 teachers were asked whether they taught reading combined with "other content area subjects" rather than with "social studies"

Tenth-Grade Classroom Context

Few questions on the 1986 tenth-grade survey had been asked of teachers in the 1976 and 1944-1945 surveys; thus comparative data for the following aspects of the classroom reading instructional context does not exist: 1) average class size, 2) number of class minutes given weekly to reading instruction, and 3) whether reading was taught as a separate subject or with other content areas.

Average class size. The average number of students in the tenth-grade classroom was not surveyed in 1944-1945 or 1976. The 1986 survey responses ranged from below 20 students to a maximum of 35 students. The average class size on responses from 110 language arts teachers was 23 students. The responses were fairly equally distributed in three size groupings: 33% responded below 20 students, 35% responded between 21 and 25 students, and 30% responded between 26 and 30 students. These tenth-grade responses are similar to the class sizes of sixth graders in the 1986 sample.

Class minutes for reading instruction. The number of minutes given to reading instruction in the tenth grade was not surveyed in 1944-1945 or 1976. Table 22 shows that nearly half of the 1986 language arts teachers who responded, 46%, spend less than 25 minutes per week or 5 minutes per day specifically teaching reading strategies. The average minutes per week was a bit higher at 61 minutes, and 29% responded to teaching more than 100 minutes per week, or approximately 20 minutes per day. However, the tenth-grade students received far less reading instruction than sixth grade students.

Conclusions regarding the amount of time spent during the entire school day for reading instruction is impossible because the survey only reached one teacher out of the six or seven the student has class with each day. The other teachers might also provide daily reading instruction. Nevertheless, the language arts classroom is the most likely place for reading instruction in the tenth grade.

Table 22

Number of Class Minutes Given Daily and Weekly to Teaching Reading in Indiana Tenth Grades in 1986

Minutes Daily-Weekly	# of classrooms	% of classrooms
5 up to 25	51	46.3
10 26-50	11	10.0
15 51-75	14	12.7
20 76-100	4	3.6
30 101-150	13	11.8
40 151-200	7	6.3
50+ 200+	10	9.0
Total:	110	
Average:	61 minutes weekly	or 15 minutes daily

Reading combined with other content area instruction. Since all 110 teachers who responded to the tenth-grade teacher questionnaire were language arts teachers, the amount of reading instruction with other school content areas is not known. Of the 110 language arts teachers, 67% responded to teaching reading combined with English, Literature, Speech, or Journalism content. The remaining 33% responded to teaching reading as a separate subject during some part of their class time. The combination of reading instruction with learning information in all content areas might have an impact upon reading achievement, but it is unknown in this 1986 "Then and Now" study.

Reading Curriculum Context

Sixth Grade. The 1976 and the 1986 surveys asked teachers to rate how well the various subtests of the 1939 *ISRT* covered their instructional objectives. The subtest ratings, additional survey comments concerning instructional objectives not covered by the test, and Blomenberg's comparison of the 1944-1945 and 1976 reading curriculums, gives a picture of the reading curriculums in all three time periods.[22]

The 1940's teachers' manuals accompanying basal reading series and the curriculum guides provided by the state provided limited and sketchy instructional strategies and skills. Further, all reading skills were to be taught by fourth grade and reading began with a primarily sight vocabulary approach. The material for reading instruction at each grade level was a single state-adopted textbook for all class members and students were only promoted after completing a satisfactory amount.

The 1970's teachers' manuals and state curriculum guides outlined great numbers of reading skills and strategies for reading instruction. Reading skills were spread through all grade levels and beginning reading approaches varied between phonic, sight vocabulary, linguistic, and language experience. Students progressed through a book at their own rate and often continued in the

[22] Blomenberg (1981) descriptions of the reading curriculums appear on pages 186 to 203 of her dissertation.

Table 23

Responses of Indiana Sixth-Grade Teachers in 1976 and 1986 as to How Well the Coverage of 1939 ISRT-Elementary: Form Bm Relates to Their Objectives for Areas Covered on the Test

Subtest	% Very Good 76-86	% Good 76-86	% Adequate 76-86	% Poor 76-86	% Very Poor 76-86	# Teachers Responding 1976-1986
Comprehension	18 23	44 46	31 26	5 5	1 1	222 249
Directed Reading	17 20	33 42	33 26	14 10	3 1	234 250
Word Meaning	23 19	38 38	31 32	5 11	3 0	233 247
Paragraph Comprehension	24 23	37 44	35 28	3 4	1 1	232 249
Sentence Meaning	20 19	32 38	34 32	0 8	4 3	229 248
Alphabetizing	34 32	30 39	26 24	9 5	1 1	233 249
Use of Index	34 36	34 38	24 23	5 2	3 0	233 249

same book at the next grade level. Cross-grade grouping was organized by many teachers. The numbers of reading materials also increased dramatically and schools could choose from a number of basal reading programs approved by the state.

Reading instruction in the 1980's has been a continuation of the 1970's with the addition of new emphases upon using everyday reading materials, content area materials, and literature to teach reading skills. But the basal reading programs are still the staple of reading instruction.

In both 1976 and 1986, the sixth-grade teachers who responded to the survey questions on the coverage and difficulty level of the ISRT, judged the coverage of their instructional objectives by the 1939 ISRT to be adequate or better. In 1986, 79% felt that all the subtests provided adequate to very good coverage and 35% felt the coverage on all subtests was good or very good. Only 7% of the teachers responded that all the subtests provided poor or very poor coverage. Also in 1986, 55% felt that all the subtests ranged from "somewhat too easy" to "somewhat too difficult." The responses slanted towards the test being difficult, as 11% felt that all the subtests were "somewhat too difficult" or "far too difficult." Only 6% of the teachers responded that all the subtests were "somewhat too easy" or "too easy." Tables 23 and 24 show the ratings of each subtest on coverage and difficulty to be quite similar in 1976 and 1986.

In Table 23, the lowest rated subtests in 1976 were Directed Reading, Sentence Meaning, and Alphabetizing. In 1986, the lowest rated subtests were Directed Reading, Word Meaning, and Sentence Meaning. In both surveys, these tests had overall "adequate" ratings. In 1986, the remaining subtests had overall ratings of "good."

Table 24

Responses of Indiana Sixth-Grade Teachers in 1976 and 1986 as to the Difficulty of the 1939 ISRT-Elementary: Form Bm for the Average Students in Their Classes

	Responses in Percent									
	Difficult					Easy			# Teachers	
	Too--Somewhat			App.		Somewhat--Too			Responding	
Subtest	76	86	76	86	76	86	76	86	1976	1986
Comprehension	7	11	41	37	51	51	1	1	226	252
Directed Reading	17	14	44	40	38	45	2	2	231	251
Word Meaning	11	13	33	35	51	50	4	2	230	250
Paragraph Comprehension	8	8	31	33	58	57	3	2	230	249
Sentence Meaning	7	7	28	30	61	59	4	2	226	245
Alphabetizing	8	5	20	18	63	69	8	8	229	249
Use of Index	6	6	18	17	65	70	10	6	228	247

		1	0	
		1	0	
		1	0	
		1	0	
		1	0	
		1	0	
		1	0	

The 1976 teachers felt the tests did not cover several areas of importance to their instructional objectives. The areas mentioned most often were using reference materials and study skills. Other areas mentioned were sequencing events, reading charts and graphs, and word recognition skills.

In 1986, ninety-eight teachers, 36%, commented that the tests did not measure word recognition, reference/study skills, and interpretive reading skills using literature. The interpretive reading emphasis included using skills such as drawing conclusions, making inferences, understanding an author's style, use of literary techniques, and recognizing fact and opinion. Outlining, graphs, charts, and using library reference tools were the areas of concern teachers listed in reference/study skill objectives. For word recognition, teachers mentioned dictionary, phonics, context, and structural analysis as areas of instruction not covered by the tests. Other areas mentioned less often were writing, reading for pleasure, listening, oral reading, discussion, and punctuation.

The difficulty ratings for the ISRT in Table 24 show that except for the Directed Reading subtest in 1976, the highest teacher response for each subtest places the difficulty in the "Appropriate Level" rating for the average students. Thus, according to these difficulty ratings, the *ISRT* would be a fairly good measure of the sixth-grade reading curriculum.

Tenth Grade. The greatest change in the reading curriculum at tenth grade between 1944-1945 and 1986 would be the addition of the elective course "developmental reading" to many schools' offerings. A 1970 study (Farr, Laffey, & Brown, 1970) reported 79% of Indiana junior high and high schools with a developmental reading course and 65% with remedial reading programs.

A review of Table 25 shows that a majority of 1976 tenth-grade teachers who responded to the "Then and Now" survey judged the tests' coverage of their instructional objectives to be adequate or better. One of four teachers judged the poetry test as "rather poor" or "poor". Several commented that the test is not representative of poetry studied today, that it is obscure, and that the time allocation is unrealistic. One of nine teachers judged the sentence meaning test as "rather poor" or "poor."

The 1976 tenth-grade teachers did not make many comments concerning instructional areas not covered by the 1939 *ISRT*. Written summaries and basic fiction techniques were the only objectives mentioned as not being well covered.

The 1986 teachers gave the subtests an overall rating of "adequate" for the coverage instructional objectives. The Comprehension and Paragraph Comprehension subtests had overall ratings of "good." Sixty-seven percent of the teachers felt the entire test provided "adequate" to "very good" coverage of their instructional objectives and 31% felt that the test provided "good" or "very good" coverage. Only 10% of the teachers responded that all the subtests were "poor" or "very poor" in covering their instructional objectives.

Additional comments concerning areas not covered by the tests were made by 41% of the tenth-grade teachers responding. The two areas of greatest response were knowing literary techniques and making interpretations from reading. The interpretations included analysis, synthesis, conclusion, inference, and other "higher" types of comprehension skills. Other instructional objectives mentioned were word recognition/vocabulary, reference, writing, spelling, and attitude towards reading. Overall, the tenth-grade teachers felt the tests provided good coverage of many reading objectives but did not cover critical thinking and interpretative skills.

As a review of Table 26 reveals, teacher responses to the difficulty of the subtests tended to fall into the too difficult range. Three out of every four teachers felt that all the subtests were "appropriate" to "far too difficult". One in every four teachers responded that all the subtests were "somewhat too difficult" or "far too difficult," suggesting that the *ISRT* might not be very representative of the tenth grade reading curricular demands. The Poetry, Directed Reading, and Comprehension subtests had the highest difficulty ratings in 1976 and 1986. The most frequent response on the other subtests was the "appropriate level of difficulty," but only seven percent felt that all the subtests were "somewhat too easy" or "far too easy."

Comments on the difficulty of the test highlighted the short time limits, inappropriate reading selections, confusing directions and answer sheets. The subtests considered most difficult Directed Reading, Comprehension, and Poetry are certainly representative of short time limits and careful directions and the large drops in Directed Reading and Comprehension subtests scores support the difficulty of the subtests. However, the Poetry subtest score is the highest of the three time periods and also received the highest ratings of difficulty. The Poetry test favors a look-back testing strategy by keying questions to numbered sections of the poem; this test may be more similar to current reading achievement tests, which allow look-backs and sufficient time to skim for answers.

Table 25

Responses of Indiana Tenth-Grade Teachers in 1976 and 1986 as to How Well the Coverage of 1939 ISRT-Elementary: Form Bm Relates to Their Objectives for Areas Covered on the Test

Subtest	% Very Good 76-86	% Good 76-86	% Adequate 76-86	% Poor 76-86	% Very Poor 76-86	# Teachers Responding 1976-1986
Comprehension	17 21	36 55	38 23	8 2	2 0	90 101
Directed Reading	13 19	32 51	45 28	9 2	1 0	88 100
Poetry	8 22	20 31	42 35	20 7	9 6	88 101
Word Meaning	24 28	30 40	42 28	4 2	0 1	89 99
Sentence Meaning	13 27	38 39	36 26	10 6	3 2	88 100
Paragraph Comprehension	18 35	33 40	43 24	6 0	0 0	90 99
Key Words*	22 31 *	36 39 *	32 24 *	10 2 *	0 1 *	90 97 *
Index*	25 31	29 39	37 24	9 2	0 1	89 97

*The 1986 survey combined these two subtests into one question concerning the coverage for the objective: "Location of Information," so the identical percentages on Key Words and Index in 1986 represent the same responses to one question.

Table 26

Responses of Indiana Tenth-Grade Teachers in 1976 and 1986 as to the Difficulty of the 1939 ISRT-Elementary: Form Bm for the Average Students in Their Classes

Subtest	Responses in Percent: Difficult Too--Somewhat 76-86	App. 76-86	Easy Somewhat--Too 76-86	76-86	# Teachers Responding 1976-1986
Comprehension	7 15	41 42	46 41	5 1	1 0	91 104
Directed Rdg.	11 10	29 44	52 44	7 3	1 0	92 103
Poetry	43 38	28 33	20 24	4 5	4 1	92 104
Word Meaning	11 12	30 37	50 46	8 5	1 0	90 105
Sentence Mng.	7 13	27 32	60 50	7 5	0 1	89 104
Paragraph Comp.**	10	14 25	61	4	1	91 105
Key Words*	1 9 *	14 25 *	59 53 *	21 13 *	4 0 *	91 104 *
Index*	6 9	15 25	57 53	20 13	2 0	89 104

*The 1986 survey combined these two subtests into one question concerning the difficulty of a subtest called "Location of Information," so the identical percentages on Key Words and Index in 1986 represent the same responses to one question.
**Some ratings for this subtest were missing in the 1976 report.

CHAPTER 5

HISTORICAL BIAS

"Is harmony between nations encouraged by the League of Nations?" That question on the *Iowa Silent Reading Test*—Advanced Level illustrates the potential for historical bias in administering a 46-year-old reading test.

Bias is defined as a characteristic of a test or test item that produces different effects or creates different demands for different groups of test takers (Scheuneman 1987). In the present study, the question is whether the 1940 *Iowa Silent Reading Test* is biased in favor of students in 1945 or 1986. Or, as the question was asked of participants in the bias study: For two students of *equal* reading ability, one from 1944-45 and the other from 1986, which test items would favor one student over the other?

Procedures

Procedures for bias studies generally include identification of potentially biased items or features by various "experts;" and data analysis to compare test performance patterns with experts' predictions.

The process isn't so simple. Bias is a controversial subject, difficult to prove in the most ideal research circumstances. Whether or not item analysis appears to support or refute expert opinion, there is no way to predict with certainty how students "should" perform on an individual item or subtest. And, even with item analysis, there's no way to measure how a biased item could affect performance on subsequent items.

One of the limitations of the present study was the lack of item performance data available for the 1944-45 testing population: so, there was no way to compare performance between 1944-45 and 1986 on any individual test item. However, subtest scores from the 1944-45 provided the basis for some performance comparisons.

In the absence of item analysis from 1944-45, the study is based on (1)expert opinion, (2)item analysis on the 1986 test results, and (3)comparison of test and subtest performance between 1944-45 and 1986.

"*Expert opinions*" were collected in the following ways:

1. Questionnaires were sent to all *sixth- and tenth-grade teachers* who administered the test in October 1986. Among the questions, teachers were asked to match the content of the ISRT against their current reading curriculum and identify any potentially biased items. Questionnaires were returned by 269 sixth-grade teachers—63% of those administering the test, and 110 tenth-grade teachers—61% of those administering the test.

2. Interviews were conducted with 29 *sixth-grade students* from two elementary schools, immediately after they completed the test. The students and the schools—one small town school in south central Indiana and one rural school in southwestern Indiana—were chosen because of their availability. The sample cannot, of course, be generalized to all of the sixth-grade students who took the test.

3. Three individual *tenth-grade students* and one class of approximately 30 *tenth graders* also were interviewed, immediately after they completed taking the test. The students attended a small town high school in south central Indiana; as with the sixth-grade students, the tenth-grade students were selected because of their availability.

4. Personal interviews were conducted with *six retired teachers* from Monroe County, and *19 retired teachers* from across the state who examined the test and completed a questionnaire which requested information regarding possible test bias.

5. *Two curriculum consultants* for the Indiana Department of Education examined the tests and were interviewed in person. In addition, the consultants distributed the test among other state department personnel and collected comments.

6. Finally, *a testing expert* at the University of Iowa examined the tests and responded to questions in a telephone interview.

In all, 469 respondents contributed 733 comments on the issue of historical bias. Their comments were organized by subtest, individual item, and issues—such as test structure, time limits and student attitudes.

After the comments were tallied, 1986 subtest and individual item results were examined for unusual performance patterns. Item analysis was aided by the knowledge that each subtest on the 1940 *Iowa Silent Reading Test* was constructed with increasing levels of difficulty. In theory, then, performance should have declined with each succeeding question for each subtest.

Bias of Various Test Components

Following subtest and item analysis, apparent anomalies were compared with expert responses, to try to match student performance with predictions of historical bias.

Vocabulary Questions

Criticism about content bias often focused on the vocabulary test. As one teacher wrote: "I just feel that this test doesn't use vocabulary that today's children are used to using or reading. Probably the child of the '40s would do better."

These were the most commonly criticized sixth-grade words, along with the number of critical comments: *peradventure*—11; *preeminent* (with an umlaut)—9; *prodigious*—7; *sinewy*—5; and *gently*—5.

A sixth grader at Riley Elementary School remembered "preeminent" only as "the one with the whole bunch of little symbols (umlaut) above it. I couldn't even pronounce it." And most dictionaries list "peradventure" as "archaic."

From examining test data, however, only "sinewy" and "prodigious" deviated from the expected pattern of declining performance with increased item difficulty. Seventeen percent of 1986 sixth-grade students correctly identified "sinewy," compared with 40% for the following word; and "prodigious" was correctly identified by 7% of the 1986 sixth-grade students, compared with 58% for the following word.

In contrast to the criticism of the vocabulary items by sixth-grade teachers, *none* of the 70 vocabulary words in the tenth-grade test was identified by more than one teacher as potentially biased.

However, mathematics curriculum consultants with the Indiana Department of Education labeled two of the tenth-grade math words as outdated: *transpose* and *consequent*. "Transpose," the first word in the math section, was correctly identified by 65% of the students, compared with 90% for the following word. But "consequent" was correctly identified by the same percentage of students—49%—as the word that followed.

Passage Topics

A few comments regarding the possible biasing effects of passage topics also emerged from expert responses. For example, several teachers identified outdated information on passages dealing with *farming*, *slate* and the *influence of the press*. The retired teachers also thought that students in 1945 were more likely to be more familiar with a question on *tuberculosis*. But no pattern of lower scores for 1986 students was found on any of those passages.

Poetry Subtest

Several tenth-grade teachers cited the poetry comprehension subtest as being biased in favor of 1944-45 students. As one wrote, the poem—"To Autumn," by John Keats—is "dated and inappropriate" for today's tenth graders; others complained that the time limit for the poetry test was too short: "It's ridiculous to give someone Keats' 'Ode to Autumn' and expect him to read and digest it and answer 20 questions on it in five minutes," one teacher wrote.

Despite these criticisms, tenth graders in 1986 performed at about one-fourth of a grade level above 1945 students on the poetry subtest. This performance may relate to the nature of the poetry test. Questions require looking back for the answer in a text section from 3 to 10 words in length which is underlined and numbered sequentially according to the order of questions. This look-back-and-skim test strategy is a characteristic of modern tests with large amounts of time provided for students to look back and locate the text which answers the question. The student's being used to this reading test strategy might reasonably score higher.

Time Limits for all Subtests

Experts complained about the time limits on the Rate-Comprehension, Directed Reading and Paragraph Comprehension tests. Reading speed was a more important aspect of the assessment of reading in the 1940's than it is in the 1980's, and teachers said their students weren't used to such time pressure.

Several teachers said their students responded emotionally to the time pressure: "We tried to approach this as fun, but I'm afraid several were very upset the minute they saw the stop watch," a sixth-grade teacher wrote.

Another sixth-grade teacher concluded: "Students in 1944-45 would have been better able to handle time limitations, since schools were not as free as today's schools in allowing students extra time to finish tasks."

A comparison between the 1940 and 1973 *Iowa Silent Reading Test* shows dramatic differences in time limits. For example, the 1940 Rate-Comprehension subtest sections require reading speeds of 120 and 167 words per minute, compared with 38 to 80 words per minute on the 1973 Comprehension subtest. The 1940 test also includes more questions per minute than the later test.

The actual test performance comparisons are mixed on the Rate-Comprehension, Directed Reading and Paragraph Comprehension tests. Sixth graders in 1986 scored at or above the levels of their 1944-45 counterparts on the subtests in which time was a factor; tenth graders tended to perform below 1944-45 levels, as much as three years behind in paragraph comprehension.

Answer folder

The physical structure of the test was the same as that of 1945, with one important exception: Students in 1945 wrote their answers in the text booklet; students in 1986 wrote in a separate answer booklet, a change necessitated by computer scoring. The use of the answer booklet also meant that the printed directions in the test booklet were unusable. Instead, teachers read directions that explained the answer booklet.

Teachers complained strongly about the answer booklet and oral directions. But the most damning testimony came from the student test takers.

"I didn't understand," a sixth grader said. "I was reading the directions and so I put the answers in there (the test booklet). I had to erase them."

Another student said he was upset at not being able to reread directions. "If you forgot what you were supposed to do, you couldn't look on the page," he said. "What are you supposed to do?"

One student said he missed the entire paragraph comprehension subtest: "I didn't get none of that done because I couldn't find where to put the answers."

Several students said they spent a lot of time looking for the correct place in the answer folder. A sixth grader said she lost her place, and another said a few other students "messed up." "They had to erase and start over," the student said. "I found I was writing in the wrong place once and had to go back."

Matching the 1940 Test to the 1986 Curriculum

The teacher questionnaire included questions about the match between classroom instruction and the skills assessed by the test. Overall, the teachers found no major discrepancies: 185 of 269 sixth-grade teachers—69%—thought ALL the subtests on the ISRT were "adequate" to "very good" in measuring what they taught, and 93 teachers—35%—thought the match was "good" to "very good" in all subtests; only 20 teachers—7%—found the match to be "poor" to "very poor."

Among tenth-grade teachers, 74 of 110—67%—found the match to be "adequate" to "very good" on ALL subtests; 34—or 31%—found the match to be "good" to "very good," while 11 teachers—or 10%—found the match to be "poor" to "very poor."

Student Attitude Toward Tests

The issue of "test wiseness" is frequently mentioned in educational circles as a factor affecting performance. But, a number of teachers turned the test-wiseness issue around and concluded that test weariness—and an overall lack of seriousness about testing—may have lowered student performance on the tests.

As a tenth-grade teacher wrote:

> Many of my students have been tested similarly for a period of years and have lost a sense of conscientiousness regarding tests like this. Because there is no score that directly affects each student and his immediate future, many don't listen well to instructions, or are otherwise irresponsible toward the tests.

Another tenth-grade teacher said today's students don't have built-in motivation to perform well on tasks, and "the reading selections themselves certainly provide little to interest the average sophomore."

A sixth-grade teacher concurred: "Kids sometimes just color in circles, because the test has no value to them, and they are tired of these tests. Even I became frustrated trying to keep time and running to help every kid with a question."

The question of student attitudes was first raised for the 1986 *Then and Now* study by Dr. A.N. Hieronymus, recently retired as director of the *Iowa Test*

of Basic Skills and professor of psychological and quantitative foundations at the University of Iowa:[23]

> Kids had much more of a compulsive attitude toward doing things they're asked to do (in the 1930's and 1940's), whether it makes sense or not. Today, kids may turn up their noses a lot quicker.

However, one retired teacher said student attitudes have changed in the last few years, and today's students are responding to pressure to perform:

> Two years ago, I would have said that was true (that student motivation would hurt test performance), but students today know how important tests are. They will take it as seriously or more seriously today. Five years ago, no. But today, yes.

Results

In practice, it proved difficult to identify biased items with any substantial degree of confidence. In addition to the limitations imposed by the missing 1944-45 data, expert opinion rarely matched student performance.

The League of Nations question provides one of the few clear examples of a strong match. Ten respondents identified the League question as biased, the highest number of responses for any item on the Sentence Meaning subtest. Item analysis showed an apparent anomaly: 89% of the 1986 students selected the correct answer for the question preceding the League question, 66% answered the League question correctly and 90% answered the next question correctly.

Expert opinion was most compelling on three bias issues—time limits, problems with the answer folder, and student attitudes. Twenty-eight responses to the elementary test and 14 advanced test responses were criticisms of the limited amount of time for subtest completion. Also, criticism of the answer folder accounted for most of the 57 critical remarks on the elementary test format and most of the 13 on the advanced test format.

On individual subtests, expert bias predictions rarely matched student performance. For example, sixth and tenth graders performed comparatively poorly in sentence meaning in 1986. That subtest drew 15 critical remarks from elementary grade level experts, but only 7 from higher grade level experts. On the other hand, experts were most critical of the elementary subtest on alphabetizing and the advanced poetry subtest, and students in 1986 performed comparatively well on both subtests.

Conclusions

> I really was all prepared to heap tons of criticism on the obsolescence of the tests, after hearing the criticism of the media. But, surprisingly enough, I really cannot do it. Except for some of the dated items . . . reading is still READING.

Those remarks, by a retired high school teacher, sum up the overall evaluations of the 1940 *Iowa Silent Reading Test*. Most of the interview subjects

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[23] Two 30 minute phone interviews were conducted with Dr. Hieronymus.

and questionnaire respondents found at least one subtest or individual question that might be biased in favor of one group or the other. But there was general agreement that the tests weren't biased.

Hieronymus, who raised questions about student motivation and the strict time limits, concluded that the 1940 tests were not historically biased, overall.

"My own subjective opinion was that there was very little historical bias in the tests," Hieronymus said. "My feeling is that they're just as appropriate now as they were then."

One sixth-grade teacher politely described the format as "rather inconvenient" and "so very different from those usually taken by the children. It is not today's usual 'streamlined' version." Another said the format was "horrible: print too small, directions difficult to understand and follow, language and words dated."

Hieronymus said he thought familiarity with the test appearance and style would play only a small role in test performance.

"Most of the research we have would indicate there's a little bit of advantage with familiarity, feeling secure about it," he said. "I would expect it would affect very few kids, but there would be some."

And the students themselves? In general, the high school students were subdued in their evaluations, criticizing only specific questions or subtests. But sixth graders were unsparing in their criticism.

"It stunk. It was boring," a sixth grader said. "I didn't see any reason for us taking it."

A classmate later—and separately—agreed that the test "stunk." "Some tests are OK," he said, "but this was boring. Some of the stuff, I didn't see any purpose to it."

A particularly thoughtful student said the test "had some very quaint questions in it."

When he was asked to clarify his "quaint" remark, the student said, "Stupid. Unusual. Weird."

The evidence—expert opinion and student test performance— supports a conclusion that the 1940 *Iowa Silent Reading Test* contains some features and items that favor students in 1944-45. The strongest cases were made for bias on the basis of features in the test: strict time limits that were more prevalent in 1944; and the more complicated and potentially confusing directions and answering structure in 1986, due to the use of the answer folder.

However, proving that the time limits and confusing structure actually affected student performance is problematic, and beyond the scope of this study. In the absence of such proof, logic would argue that students must have been affected by such factors.

On the issue of content, surprisingly few items appeared to be historically biased. Surely, "peradventure" is a foreign word to today's students, but word-frequency lists from the 1930's and 1940's indicate it rarely appeared in that era. And item analysis and student interviews indicated that most students, however baffled, answered the League of Nations question "correctly."

Other issues also remain unanswered, perhaps unanswerable. Did the above factors have a cumulative effect on student performance? Did student attitudes play a role? Even on the items and subtests in which 1986 students

excelled, would a test without these biasing factors have yielded more impressive results?

The questions will remain. But intuition—better educated now than the variety that gave birth to this bias study—can supply some answers. Was the 1940 *Iowa Silent Reading Test* biased in favor of 1944-45 students? Probably, yes. Did the test contain enough biasing factors to influence student performance? Probably, yes. Would 1986 students have performed relatively better on a more current test? Probably, yes.

How much better? That question remains unanswered.

CHAPTER 6

CONCLUSIONS

On the one hand, the findings from the study are quite clear; we can review the data and reach certain conclusions about the relative reading achievement of Indiana sixth and tenth graders in 1944-1945, 1976, and 1986. There are, however, questions that remain. First, what do these results add to our knowledge about the literacy trends of children in school, and what do they add to our broader understanding of literacy trends for all citizens? Secondly, what questions do these results provoke in regard to understanding the reasons for increased or decreased levels of literacy? Third, what policy suggestions do these results hold for the Indiana Department of Education, one of the sponsors for this study?

Summary of the Findings

On the same test administered in 1944-45, 1976, and 1986, Indiana's sixth-grade students scored higher in reading achievement in 1986 than did the state's sixth graders of 1945 and 1976. But tenth-grade scores continued to decline in the 41-year comparison of reading achievement.

On a separate and more recently normed test, sixth graders in Indiana scored three-quarters of a year above the national average in reading achievement, while tenth graders were a half-year below the national average. The following points summarize the major findings.

Test Findings

1. Sixth-grade reading achievement has increased from grade level 6.2 in 1944-1945, and 6.1 in 1976, to 6.6 in 1986 on the ISRT Total Median Score. The expected level of achievement at the time of testing was grade level 6.2.

2. Tenth-grade reading achievement has declined from grade level 10.2 in 1944-1945, and 10.0 in 1976, to 9.7 in 1986 on the ISRT Total Median Score. The expected level of achievement at the time of testing was grade level 10.2.

3. Sixth-grade gains in 1986 were significant in reading rate and reference type reading skills. Moderate gains were achieved in word knowledge and comprehension. These comparisons are based upon the 1943 norms of the ISRT.

4. Tenth-grade gains in 1986 were significant in reference type reading skills. Slight gains were achieved in word knowledge and poetry comprehension. Significant declines were observed in reading rate and paragraph comprehension. These comparisons are based upon the 1943 norms of the ISRT.

5. Sixth-grade percentile scores increased from the 35th percentile in 1944-1945, and the 32nd percentile in 1976, to the 45th percentile in 1986. The expected norm percentile for the Total Median Score at the time of testing is given in the 1943 ISRT Test Manual as the 35th percentile.

6. When adjusted for age differences—today's sixth graders are on average 10 months younger than the sixth graders of 1945—the Total Median Score percentiles are the 35th in 1944-1945, the 49th in 1976, and the 59th in 1986.

7. Tenth-grade percentile scores declined from the 42nd percentile in 1944-1945, and the 40th percentile in 1976, to the 34th percentile in 1986. The expected norm percentile for the Total Median Score at the time of testing is given in the 1943 ISRT Test Manual as the 42nd percentile.

8. When adjusted for age differences—today's tenth graders are on average 17 months younger than the tenth graders of 1945—the percentiles are the 42nd in 1944-1945, the 46th in 1976, and remain at the 46th in 1986.

9. In a 1986 national comparison on the MAT, sixth graders scored at grade level 6.9—eight months above the national norm.

10. In a 1986 national comparison on the MAT, tenth graders scored at grade level 9.6—five months below the national norm.

11. In a 1986 sixth-grade statewide community type comparison, the ISRT average Total Median Score was highest for suburban schools—six months above the norm, then rural schools—five months above the norm, then large town schools—three months above the norm. Urban schools scored one month above the norm and small city schools scored at the norm level expected.

12. In a 1986 tenth-grade statewide community type comparison, the ISRT average Total Median Score was highest for suburban schools—two months below the norm, then large town schools—three months below the norm, then rural schools—4 months below the norm. Urban schools scored lowest at one year and six months below the norm level expected.

13. In a 1986 sixth-grade statewide geographic comparison, the ISRT average Total Median Score was highest for North schools—five months above the norm, then Northwest and South schools—3 months above the norm, then Indianapolis schools at the norm level expected.

14. In a 1986 tenth-grade statewide geographic comparison, the ISRT average Total Median Score was highest for North and Indianapolis schools—three months below the norm, then South schools—eight months below the norm, then Northwest schools—two years below the norm level expected.

Context Findings

1. Indiana population changes are evident. The non-white ethnic distribution in the population nearly tripled from the 1940 level of 3.6% to the 1980 level of 9.7%. Most of the change between 1940 and 1970 was an increase in Blacks from 3.6% to 6.9%. In the following decade, Hispanics increased from .3% to 1.6% and Blacks increased only .6%. School ethnic distributions parallel these changes, running slightly higher in the total percentage of ethnic groups—4% in 1940, 11% in 1970, and 13% in 1986. Movement to the urban areas in the decade leading up to the 1970 census was followed in the 1970's by movement to suburbs and smaller cities and towns. Rural areas decreased in population throughout the four decades. By 1980, sharp declines occurred in farming and small decreases occurred in machine operator and laborer occupations. Professional/Technical, Clerical, and Service occupations have increased significantly. These changes suggest a population for which higher levels of literacy are characteristic and necessary for success.

2. Indiana students in school are younger. The average age of sixth graders in 1980 remained at eleven years and six months, ten months younger

than the 1940 sixth graders. The average age of tenth graders in 1980 decreased to fifteen years and two months, three months younger than the 1970 tenth graders, and seventeen months younger than the 1940 tenth graders. Pupil retention rates decreased dramatically from 20.0% in 1944-1945, to 1.4% in 1976, and 2.1% in 1986.

3. The educational level of Indiana citizens has risen in the past four decades. The dropout rate for Indiana tenth graders in 1986 was 6.0%, an increase from the 1976 rate of 4.4%, but still far below the 14.0% dropout rate in 1944-1945. The percentage of Indiana citizens over age 25 who have completed high school has increased from 24.5% in 1940, and 53.0% in 1970, to 65.0% in 1980. The percentage of Indiana citizens over age 25 who have completed college has increased from 3.8% in 1940, and 8.4% in 1970, to 12.0% in 1980.

4. Medium sized schools are a more common experience for 1986 sixth graders, evidenced by a shift in population away from dense urban and sparse rural areas, a reduction in the average class size, a decrease in the number of schools with enrollments over 100 sixth graders, a decrease in the average number of classrooms per building, and an increase in the popularity of organizational plans that use middle schools with fewer number of grades per building. However, average tenth-grade enrollments have increased, indicating a larger school experience for tenth-grade students.

5. The length of the school year has fluctuated in the three time periods. At the sixth-grade level, the school year was 8.6 months in 1945, 9.4 months in 1976, and 9.0 months in 1986. At the tenth-grade level, the school year was 8.4 months in 1945, 9.25 months in 1976, and 9.0 months in 1986.

6. At sixth grade, reading instruction and curriculum in 1986 is similar to 1976. Departmentalization and ability grouping for reading instruction predominates. Remedial programs were provided by 70% of the 1986 schools. The average number of minutes per week spent teaching reading—273 minutes—remains close to the 1976 level of 283 minutes per week, and both far exceed the 1944-1945 level of 184 minutes per week. Approximately 75% of the teachers in 1976 and 1986 samples teach reading combined with content area subjects compared to 37% in 1944-1945.

7. At tenth grade, reading instruction is unclear. Remedial programs were provided by half the schools in 1986. The average number of minutes per week spent teaching specific reading strategies was 61; however, almost half the teachers teach specific reading strategies less than 5 minutes per day. Reading instruction is combined with language arts content by 67% of the tenth-grade teachers.

8. The classroom experience might be somewhat different in the three time periods. The average class size in sixth grade decreased dramatically from 31 to 50 students in 1947, to 21 to 30 students in 1976, and to 21

to 25 students in 1986. In 1986, the average class size in tenth grade was 23 students. In 1944-1945, each classroom had an average of 2.5 grades with some having as many as eight grades in one room. In 1976 and 1986, the average grades per classroom was 1.08 and 1.14, and only 6.5% and 9.5% of the classrooms contained more than one grade level. Teachers in 1947 and 1986 tended to have more teaching experience than teachers in 1976.

Placing the Results in Context

The Indiana Then and Now 1986 study provides the basis for guarded optimism if test scores and comparisons with the past are of primary concern. It is important, however, to view the current status of reading achievement in Indiana in relation to the broader picture of the nature of literacy and the changing nature of literacy demands in the state and the nation.

In his Reading Hall of Fame address (1987), William Eller spoke of the recent expansions of the meaning of the term "literacy." With the advent of radio, the meaning of literacy extended beyond the written word to include listening comprehension. Television brought visual literacy, computers brought a new extension to computer and technological literacy. The workplace added the dimension of functional literacy, and the recent concern for building a common base for societal knowledge, values and beliefs has extended the term to include cultural literacy. Rightly so, the authors of the NAEP report, "Literacy: *Profiles of America's Young Adults*," observe that "there is no single measure or specific point on a scale that separates the literate from the 'illiterate'." (p. 1)

The ever-expanded definition of literacy is coupled with ever increasing standards. As was pointed out earlier, essentially all of today's young people meet and exceed the standards of a hundred years ago. In fact, the majority meet or exceed the standards of the 1940's. However, satisfaction with such comparisons could easily lead to disaster. Rather than to reflect on the past, it is critical to assess the present and to anticipate future demands. Quoting Will Rogers, "Everyone is ignorant, only about different things," Eller (1987) goes on to suggest that, given the multiple meanings of literacy, "it may be equally appropriate to say that everyone is illiterate in some situation or other." (p. 4) Educational leaders in the state appear to be aware of this condition, as reflected in the education plans and policies currently being developed and implemented.

There is a danger in thinking that continued literacy development is a need of only those who are defined as illiterate by some arbitrary standard. This type of thinking leads to narrow thinking and planning, as suggested by Venesky, Kaestle and Sum in *The Subtle Danger* when they wrote: "We will not collapse tomorrow from a lack of adequate literacy skills, but we may find that year by year, we continue to fall behind in international competitiveness, and that society becomes more divided between those who are skilled and those who are not." (p. 53) As we live the present and anticipate the future, it is important to strive for broader and higher levels of literacy performance. The implications for schooling are obvious. Schooling needs to relate more realistically to the changing world outside of school. By way of one example, the changing realities in Indiana with the influx of foreign corporations and the desire to increase the

export of Indiana products could well lead to a further expansion of literacy to include bilingual and multilingual dimensions.

The challenges are real and are very present. It is hoped that the next decade will bring meaningful improvements in literacy development among Indiana's citizens. Expectations will be met as Indiana citizens strive to maintain and improve their overall well-being.

Needed Research Suggested By The Results

As with all research, this study leaves more questions unanswered than answered. We have learned something about the reading achievement levels of Indiana sixth and tenth graders over a 41 year period. However, we know little about the reasons for those changes—and it is the reasons that are needed to guide school policy. We can applaud or lament the results of this study, depending on our perspective in interpreting the results. But knowing the present status is not enough, we need to find out what accounts for what we have found. The four research areas discussed below seem to us to be those that are most significant. Others may find different topics to be more relevant.

Sixth-grade/tenth-grade differences

This study supports the results of other studies that have found that students in grades one to six have made significant gains over their age and grade counterparts from previous generations. On the other hand, for tenth-grade students there are no gains and even slight declines. Of all of the findings from this study, this result is probably the most disconcerting to educators nationally, and especially to those in Indiana. The finding suggests that the longer students are in school, the more difficult it is to maintain the higher levels of reading achievement that have been demonstrated at lower grade levels.

It should be emphasized that the decline is a relative decline. Tenth graders are not significantly poorer readers than their counterparts of earlier decades. It is just that the significant increases at the earlier grade levels are not maintained. It seems quite likely that if the increases at the earlier grade levels were maintained into the secondary grades, there would be much less national concern about levels of literacy.

The sixth-grade/tenth-grade 1986 comparison in Indiana provides more dramatic evidence for this anomaly. On the MAT, sixth graders scored significantly above current national norms while the tenth-grade students scored significantly below national norms. This result shows that the decline from sixth to tenth grade in Indiana is even more pronounced than it is in the rest of the nation. If Indiana sixth and tenth graders had performed at national norm levels, a conclusion could be drawn that Indiana is about the same as the rest of the nation. That is, long term reading gains at the lower grade levels level off at higher grades, and even show slight declines. However, the significance of the MAT results is that Indiana tenth grade show an even stronger decline than other tenth graders in the nation in the gains achieved at the lower grade levels.

The importance of this result cannot be over-estimated. It is the highest levels of literacy that are needed by citizens as we move farther into the information era. Readers who can analyze and evaluate what they read are needed for the future success of the nation—and for the personal success of each individual.

The reasons that account for the decline must be investigated. Cultural influences may be a factor. Do such things as TV viewing, the preponderance of students who hold part-time jobs, and the lack of conversations and discussions in the home cause less reading and therefore lowered achievement levels?

Instructional activities also need to be studied. Does the focus on basic skills instruction in the elementary grades result in students who are able to read at a literal level, but who are limited in their ability to think about what they read? Is there a lack of attention at the upper grade to teaching interpretative reading skills, especially as those skills relate to the reading of literature? Do upper grade reading assignments require the synthesis of many ideas gained from print, or just the copying of answers for homework questions? Does the emphasis on basic competency testing reduce reading to disjointed skills and force an instructional emphasis on drilling for mastery of those isolated skills, at the expense of reading?

Do the attitudes of the students affect performance? Perhaps the older students feel that the tests are not important; at least they may feel this way to a greater degree than do elementary students. If this is the case, then the test results may reflect nothing more than a lack of desire to perform well.

Finally, it may be that students at the upper grades are actually reading better, but that the tests do not reflect this fact. It may be that the tests assess a narrow definition of reading that is circumscribed by the kinds of things that test authors think that students "should" read. It may be that a test (or other samples of students' reading) that include a wider variety of reading selections will demonstrate that students are able to read much better than we thought they could. The tests, with their emphasis on a single correct answer, may not assess the higher-thinking skills that are desireable. This would be a plausible explanation if it were not for the fact that Indiana tenth graders are significantly below the rest the norming population.

Whatever the reasons for the present state of affairs, this is an area in need of additional study. It is not enough for us to conclude that tenth-grade students have not shown the gains that sixth-grade students have shown; we need to learn why this situation exists. Without this vital information, we can be led to the wrong conclusions and to inappropriate actions. It is not just higher test scores that are needed. What is needed are higher test scores that truly reflect higher levels of reading.

What accounts for change

In addition to the need to study the reasons for the differential achievement gains by sixth and tenth graders, this study provides a basis for studying school and societal factors that account for change. The results of the study can pinpoint specific areas of the state and types of communities where test score increases or declines have been most dramatic. Case studies of these communities may provide additional insight into the factors that produce test score changes.

The context data gathered for this study provides initial hypotheses for such studies. For example, it appears that length of the school year is not related to test score changes. Neither does it seem that the amount of time devoted to the teaching of reading makes much difference; however, there is much confusion as to what actually constitutes the teaching of reading, es-

pecially at the upper grades. Factors that seem to hold the greatest possibility for influencing change seem to be personal characteristics of each student. Reading habits, attitudes toward reading, and attitudes toward school in general, all of which are influenced by instruction and the nature of schooling are prime candidates. But what is it about the lives and education of students that produce these results?

Studies that undertake to examine the causes of reading achievement will need to incorporate a wide variety of variables, as it is almost certain that simple linear cause/effects will not be found. Reading achievement is a complex human behavior, differentially influenced by a wide range of variables.

Broadening of the assessment

Many people who have written about literacy have recognized the importance of defining literacy much more broadly than just basic reading ability, especially as that is reflected by single test scores. Literacy is much more than a test score, and it is much more than the ability to read. We need to conduct studies that help us to understand this broader definition of literacy.

If schools are to develop citizens who not only can but do read, then we need to know the kind of progress we are making in this area. The sixth-grade/tenth-grade decline noted in this study may be the result of student apathy or dislike for reading. Perhaps we do teach children to know *how* to read, but do we teach them how to use reading, to appreciate the ideas in books, to understand the value of reading for contemplating ideas, for deep thinking, and for broadening experiences? If we were to develop in students a strong positive attitude about reading, there would be little concern about teaching reading skills, because students would learn them as a natural consequence of reading.

This study has not gathered any information about reading habits, reading attitudes, the availability of printed materials, or the need to read to meet human needs. While some things are known about how to assess some of these factors, it is important that we begin to factor these variables into our studies of reading trends. If we do not, we will be left with the focus on teaching reading only to increase reading scores on tests and that may very possibly be part of the reason for the tenth-grade decline.

Helping the public to understand achievement levels

As with any study of this sort, it is important for the public to understand what the results mean if they are to be used to inform policy decisions. When the initial results of this study were released, newspapers across the state titled the article, SIXTH GRADERS READING BETTER—TENTH GRADERS READ WORSE. This study provides much more information—and much less than that.

We will fail to achieve good educational policy if we fail to educate the public, including the media, about the limited meaning of test scores as well as about the complexities of setting test scores in a context that includes a wide range of changed demographic and educational variables.

But the question that remains to be answered is how to get a fleeting public's attention focused on understanding what schools should be trying to accomplish and what they are accomplishing. Many citizens would be very satisfied if the tenth-grade ISRT results had shown some improvement over

previous years. Even more believe the goal of the schools is to produce better test scores. Perhaps studies of this sort are part of the problem, as they seem to suggest that test scores hold the key to understanding what the schools have accomplished.

No one would suggest that the public should not be very involved in helping to shape the schools and the curriculum. But this study raises questions about how to adequately inform the public so good decisions will be made.

Limitations and Caveats

The first chapter of this monograph included a discussion of the limitations in then-and-now studies. This particular study was not free from those problems, although steps were taken to alleviate as many of them as possible. The test bias analysis, the use of both a recently normed and the original tests, the collection of context data, and the presentation of results with both age-corrected and non-altered results were attempts to accommodate some of these problems. In addition, the presentation of the results were cast in a framework that took cognizance of this study's limitations.

The following limitations were mentioned throughout this monograph, but they are important enough to be repeated here:

1. Dropouts may have eliminated many of the low achievers from the 1944-45 sample. While both the 1976 and 1986 dropout rates are much lower than those of 1940, the 1986 rate is higher than 1976. This seems to suggest that the 1976 group was at the greatest disadvantage because it has been shown that it is the poorest achieving students who drop out of school. The dropout factor is only an issue at the tenth-grade level.
2. The chapter dealing with the bias of the ISRT against 1976 and 1986 students seems to be supported by the data that was collected. Tenth-grade students attitudes toward testing and the timing conditions of the ISRT test seem to both be viable factors that may have affected 1976 and 1986 student performance. Despite the evidence that the tests may have been biased to some extent, the more recently normed tests revealed the same pattern of performance. Moreover, the bias factor does not seem to relate to specific test items, at least not to enough items to make any appreciable differences in the scores. The bias factor seems to relate more to the overall testing conditions.
3. The context of schooling and of society in general certainly have a great deal to do with test score performance. The 1976 study (Farr, Fay, and Negley, 1976) summarized the changed conditions from 1944-45 to 1976. That summary is certainly just as appropriate for the 1986 comparison:

> The general impact of more prosperity is evident in society's life styles. Since 1945, for example, America has been united from coast to coast by multilaned superhighways. With a higher income, one can afford the car and other expenses to travel, as well as gadgets, appliances and toys to compete with reading. And just as these experiences can both compete for our time and can be educational, so we are unsure about the exact balance between how they discourage or encourage reading.
>
> Very few Indiana children had ever seen television in the mid 1940's, but by 1976 [and certainly by 1986] it was a focal point of a majority of Hoosier homes. Television has had a tremendous impact on life styles and values. This

is especially true for children. Had anyone told the teachers and parents of the post-World War II period that their grandchildren would be sitting in front of that electric box from 20 to 50 hours a week, they might have predicted the total demise of reading as an activity. Since effective reading instruction is structured on a child's interests and needs, it is obvious that television can contribute to developing the background and interests necessary for meaningful reading experiences, but generally it is accepted that the net effect of television on the reading habits of our children (as well as of adults) is negative. How much of what type of TV viewing is helpful or harmful is a subject of such potential import that it needs researching on an intensive scale.

Perhaps the increased prosperity of 1976 compared to 1944-45 ought to operate to the overall advantage of the later sample in reading achievement comparisons. To mention an obvious and relevant advantage—attractive books, magazines and other reading material abounded on a myriad of topics in 1976; in the war years printing was not rationed but was limited by national priorities. And readers had more money in 1976 than in 1944-45 to buy reading material.

In this study, the impact of such societal and educational factors was only hypothetically assumed. The partial data presented here indicate that there were differences in the two time periods from which students were tested and that these differences might account for differences in the test results.

4. Other limitations include:

- Descriptive data on the 1944-45 population was limited.

- Age differences are based on census bureau reports and may not accurately reflect age differences of the subjects who actually took the tests.

- There is no way to know if the 1976 or 1986 students were more "test wise" or more "turned off to tests" than their 1944-45 counterparts.

- The data analysis for the 1944-45 study was not thoroughly explained in the available reports and some inferences had to be made about how the data was handled.

- The actual test papers and item analysis data was not available for the 1944-45 students. The data comparisons were conducted on the basis of group data only.

- There was only limited control over the actual administration of the tests at any of the three time periods. Tests were sent to the schools with directions and procedures for testing described. However, the actual responsibility for the testing was in the hands of the school.

- The 1944-45 sample was not scientifically controlled; however, it did represent a 25% sample of all of the sixth and tenth graders in the state.

The limitations of this study should not cause us to lose sight of the potential importance of this data for making policy decisions regarding education in

Indiana. Such policy decisions will be made with or without such data. With the caveats and cautions clearly before us—and the understanding of the context for each of the time periods—this data can be useful to those empowered with leading education in the state.

A Response from the Indiana Department of Education

If our schools are to meet the challenges of the 21st century, school performance must be measured by 1) how much students have learned and 2) how capable they are of continuing to learn. Education reform in Indiana will have meaning only if our schools can bring about increased student learning and achievement. However, as schools are asked to refocus their curricula and to increase their emphasis on student achievement, it is not surprising that schools will be confronted with barriers to that change. The Department of Education can help to alleviate some of these barriers by the educational policies which they develop. The "Then and Now Study" has helped the Department to identify areas were additional educational policies are needed.

Several questions regarding the declining achievement of Indiana's students were raised in this study. Beginning with 1987-88 school year, the Indiana Department of Education will begin implementation of a statewide testing program. The Indiana Statewide Testing of Educational Progress (ISTEP) will test students in grades 1, 2, 3, 6, 8, 9, and 11. The test will cover reading, writing, mathematics, social studies, and science. ISTEP will be based on achievement standards as defined by the Indiana Department of Education. These "achievement standards" will identify the essential knowledge that Indiana students should possess at different stages of their education. Beginning in the summer of 1988, each student in grades 1-8 will be required to attend a summer remedial program providing at least 80 instructional hours if the student 1) has been identified by a classroom teacher and the student's principal as needing remediation, or 2) has received ISTEP scores in mathematics or language arts that fail to meet state achievement standards.

Research has reported that students achieve more academically when their parents are interested and involved in their schooling. (Henderson, 1981) Three important family influences that seem to determine achievement are: 1) student and parent expectations for academic performance, 2) the extent to which they engaged in activities to support these expectations, and 3) the student's attitude toward hard work as necessary to success.

The parental educational level and the amount of reading material in the home contributes significantly to a student's reading achievement level. According to recent studies, parental involvement in almost any form improves student achievement. These studies conclude that parents are a tremendous resource for public education and they are a resource which has remained largely untapped.

In August, 1986, the Learning and Achievement Strategic Task Force recommended to the State Board of Education that the Indiana Department of Education develop a comprehensive plan designed to involve parents more actively in the education of their children. Beginning in the 1987—88 school year, the Indiana Department of Education will assume greater responsibility in assisting local school districts to achieve increased parental involvement.

The study raised concern as to whether our teachers are provided adequate opportunities to continually upgrade their teaching skills. Educational policies are needed which encourage teachers to continue acquiring knowledge and to expand their repertoire of teaching methodologies. Teachers must see themselves as lifelong learners and become knowledgeable of the various instructional strategies to employ when teaching students. Policy decisions which make it possible to attract, retain, and reward outstanding teachers will have lasting affect on the achievement of students.

Two legislative items passed by the FY'87 General Assembly will assist teachers to improve their skills. One item established a "Beginning Teacher Internship Program". As a result of this legislation, each school corporation will be required to prepare a plan that describes the desired teaching skills and practices necessary to achieve competency in teaching. Superintendents will be asked to appoint mentor teachers to assist their beginning teachers. As a result of this legislation, teachers who are selected as mentors will be expected to be knowledgeable of current instructional strategies. This program also provides a way to reinforce the concept that teachers need to be involved in continuous learning opportunities.

Implications were made that teachers need professional development opportunities to help them in organizing their classrooms to address the needs of their students. The other piece of legislation passed requires each school corporation to develop "staff evaluation plans." According to the legislation, each corporation must implement staff performance evaluation plans for all certified personnel as a condition of accreditation. These plans will also provide for individual growth and periodic assessment of a teacher's effectiveness. One of the goals of this rule will be the encouragement of teachers to become lifelong learners and to keep abreast with new instructional strategies.

The legislative initiatives passed by the 1987 General Assembly were the framework of "Indiana's A+ Program for Educational Excellence," designed to help Indiana educators achieve excellence in education. The program posed higher goals for education and stressed increased accountability. As part of Indiana's A+ program for educational excellence, schools will be asked to: 1) develop methods to motivate students, 2) improve study habits of students, and 3) create methods to maintain a positive public perception toward school.

The educational initiatives implemented as a result of the "A+ Program" will help Indiana educators address the concerns raised in the "Then and Now Study". Indiana policy makers have demonstrated a belief that Indiana's schools can be transformed to serve all students equitably and with excellence.

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APPENDIX A

RETURN BY: JUNE 9, 1986

THEN AND NOW: Reading Achievement in Indiana

Principal's Name:_____

School Name:_____

School Address:_____

Phone Number:_____

Please answer the following questions and send this form to Betty Johnson, Indiana Department of Education, Division of Reading Effectiveness, Room 229 State House, Indianapolis, IN 46204. Whenever possible, please answer the questions in terms of the 1986-87 school year.

If you have any questions, please call Ms. Johnson at (317) 927-0194. Thank you.

1. Name and title of contact person at your school to receive and mail tests

_____

2. Your estimate of the number of classes at the sixth grade level in September 1986

_____

3. Your estimate of the approximate number of pupils in the sixth grade at your school in September 1986

_____

4. How would you describe the community served by your school:

( ) Primarily agricultural
( ) Urban
( ) Suburban
( ) Other _____

5. How are the schools in your system organized?

( ) 6-3-3
( ) 6-4
( ) 6-6
( ) 4-4-4
( ) 6-2-4
( ) 7-5
( ) 5-3-4
( ) Other _____

6. What is the average class size in your school?

( ) Below 15
( ) 15-20
( ) 21-25
( ) 26-30
( ) 31-35
( ) Above 35

7. Does your school provide special reading programs for pupils with various handicaps?

( ) Disabled reader
( ) Learning disabled
( ) Mentally retarded
( ) Other _____

8. If special reading instruction is provided, how is this instruction or assistance rendered?

( ) Tutors assigned to classroom teacher
( ) Remedial reading program
( ) Learning disability program
( ) Special instruction in regular classes
( ) Other _____

9. Approximately what percent of the pupils in your school speak a language other than English outside of school or come from homes in which a language other than English is spoken most of the time? _____%

10. What percent of pupils in your school are members of each of the following ethnic groups:

(%) White
(%) Black
(%) Hispanic
(%) Oriental
(%) American Indian
(%) Other

11. How many days are in your school year? _____

12. Approximately what percent of the families in your school receive any type of public assistance (AFDC, food stamps, Social Security)? _____ %

Please return this questionnaire by JUNE 9, 1986 to:

Betty R. Johnson, Director
Division of Reading Effectiveness
229 State House
Indianapolis, IN 46204-2798

THEN AND NOW Indiana Reading Research Study
Division of Reading Effectiveness, Indiana Department of Education
Center for Reading and Language Studies, Indiana University

Teacher Questionnaire: Elementary Test

Welcome to the 1986 THEN AND NOW study of reading achievement in Indiana. This statewide study will be comparing the reading achievement of sixth and tenth graders in 1944-45, 1976, and 1986 administrations of the *Iowa Silent Reading Tests*. This is especially important in light of continued publications questioning the effectiveness of reading instruction in the schools. The 1986 THEN AND NOW study found reading achievement in Indiana improved over the 1944-45 testings for students the same age.

The 1986 THEN AND NOW study will also administer the *Metropolitan Achievement Tests* to some Indiana students to establish current norms for reading achievement. If you are to administer either the *Iowa* or *Metropolitan*, please follow the directions of the study's coordinator in your school.

As a sixth grade teacher involved in reading instruction, the completion of the following questionnaire is critical to the study's success, even if someone besides you gives the tests. Your analysis of the *Iowa* tests in this questionnaire will allow the research team to evaluate test content validity and the contextual factors relative to testing students years apart in time. Please take the time to fully answer each of the following questions and make sure this questionnaire is returned to your contact person to be mailed with the completed tests.

Thank you for your efforts in working with the State Department of Education Division of Reading Effectiveness and the Indiana University Department of Education Center for Reading and Language Studies. Your help is greatly appreciated.

Teacher Questionnaire

1. School Name _____

2. How many students are in your class? _____.
   (If departmentalized, check here _____and give average reading class size)

3. How do you organize your students for reading lessons?

   ( ) Ability groups
   ( ) Mixed abilities
   ( ) Other _____

4. Do you teach reading in connection with other school subjects?

   ( ) Yes ( ) No

If yes, check those that apply:

   ( ) English ( ) Math
   ( ) Social Studies ( ) Other
   ( ) Science

5. Do you have more than one grade in your classroom?

   ( ) No ( ) Yes — What grades? _____

6. How much time do you spend teaching reading?

_____minutes per day
_____minutes per week, if daily schedule varies

7. How many years have you taught? _____

The following items relate to your opinions concerning the *Iowa Silent Reading Test* that was used for this study.

8. How well did the *Iowa* tests match your instructional objectives?

Scale
5 - Coverage was very good
4 - Coverage was good
3 - Coverage was adequate
2 - Coverage was poor
1 - Coverage was very poor

	(5)	(4)	(3)	(2)	(1)
Comprehension	( )	( )	( )	( )	( )
Directed Reading	( )	( )	( )	( )	( )
Word Meaning	( )	( )	( )	( )	( )
Paragraph Comprehension	( )	( )	( )	( )	( )
Sentence Meaning	( )	( )	( )	( )	( )
Alphabetizing	( )	( )	( )	( )	( )
Use of Index	( )	( )	( )	( )	( )

Indicate below any areas or instructional objectives that are an important part of your reading program and are not adequately measured by the *Iowa* tests.

_____
_____
_____
_____
_____
_____

9. Indicate below your judgment of the difficulty level of the *Iowa* tests for the average student in your class.

Scale
5 - Far too difficult
4 - Somewhat too difficult
3 - Appropriate level of difficulty
2 - Somewhat too easy
1 - Far too easy

	(5)	(4)	(3)	(2)	(1)
Comprehension	( )	( )	( )	( )	( )
Directed Reading	( )	( )	( )	( )	( )
Word Meaning	( )	( )	( )	( )	( )
Paragraph Comprehension	( )	( )	( )	( )	( )
Sentence Meaning	( )	( )	( )	( )	( )
Alphabetizing	( )	( )	( )	( )	( )
Use of Index	( )	( )	( )	( )	( )

Indicate below, by test title and/or item numbers, any test or item which you thought was too difficult in any way or inappropriate for your students. In addition, was the test format appropriate for your students? Feel free to share any other comments about the test.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

10. Consider the three groups of students that have taken this test — 1944-45, 1976 and 1986. In your judgment, would students in any of the three years have an advantage over the other two groups in answering any of the questions? Which questions? Please explain, your comments will be very helpful.

_____
_____
_____
_____
_____
_____

11. Indiana University and the Indiana Department of Education are conducting related studies concerning the relative performances of 1944 and 1986 students on the *Iowa Test of Basic Skills*, and Indiana teachers may be needed to perform some of the analysis. If you volunteer to help, a small stipend will be paid for several hours of work. Because of the historical nature of the study, teacher age is important in considering perspective. If you are interested in participating, please write your name, age and telephone number below. You are under no obligation.

Your name _____

Age _____

Telephone number _____

THEN AND NOW Indiana Reading Research Study
Division of Reading Effectiveness, Indiana Department of Education
Center for Reading and Language Studies, Indiana University

Teacher Questionnaire: Advanced Test

Welcome to the 1986 THEN AND NOW study of reading achievement in Indiana. This statewide study will be comparing the reading achievement of sixth and tenth graders in 1944-45, 1976, and 1986 administrations of the *Iowa Silent Reading Tests*. This is especially important in light of continued publications questioning the effectiveness of reading instruction in the schools. The 1986 THEN AND NOW study found reading achievement in Indiana improved over the 1944-45 testings for students the same age.

The 1986 THEN AND NOW study will also administer the *Metropolitan Achievement Tests* to some Indiana students to establish current norms for reading achievement. If you are to administer either the *Iowa* or *Metropolitan*, please follow the directions of the study's coordinator in your school.

As a tenth grade teacher involved in English or Reading instruction, the completion of the following questionnaire is critical to the study's success, even though the guidance personnel may be giving the tests instead of you. Your analysis of the *Iowa* tests in this questionnaire will allow the research team to evaluate test content validity and the contextual factors relative to testing students years apart in time. Please take the time to fully answer each of the following questions and make sure this questionnaire is returned to your contact person to be mailed back with the completed tests.

Teacher Questionnaire

1. School Name _____/School Code _____

2. Tenth grade subject you teach? _____.

3. Please give the approximate number of students in each of your tenth grade classes, then the average class size:

Class size: _____ _____ _____ _____ _____ _____
Average class size: _____

4. How many years have you taught? _____.

5. Do you teach reading as part of your subjects? ( ) Yes, ( ) No

6. Realizing that "teaching reading" may refer to everything you do in the English or Reading classroom, how much time do you specifically spend teaching reading strategies as part of your subject?

_____minutes per day
_____minutes per week, if daily schedule varies

The following items relate to your opinions concerning the *Iowa Silent Reading Test* that was used for this study.

7. How well did the *Iowa* tests match your instructional objectives?

Scale

5 - Coverage was very good
4 - Coverage was good
3 - Coverage was adequate
2 - Coverage was poor
1 - Coverage was very poor

	(5)	(4)	(3)	(2)	(1)
Comprehension	( )	( )	( )	( )	( )
Directed Reading	( )	( )	( )	( )	( )
Word Meaning	( )	( )	( )	( )	( )
Paragraph Comprehension	( )	( )	( )	( )	( )
Sentence Meaning	( )	( )	( )	( )	( )
Location of Information	( )	( )	( )	( )	( )
Poetry Comprehension	( )	( )	( )	( )	( )

Indicate below any areas or instructional objectives that are an important part of your reading program and are not adequately measured by the *Iowa* tests.

_____
_____
_____
_____
_____
_____

8. Indicate below your judgment of the difficulty level of the *Iowa* tests for the average student in your class.

Scale

5 - Far too difficult
4 - Somewhat too difficult
3 - Appropriate level of difficulty
2 - Somewhat too easy
1 - Far too easy

	(5)	(4)	(3)	(2)	(1)
Comprehension	( )	( )	( )	( )	( )
Directed Reading	( )	( )	( )	( )	( )
Word Meaning	( )	( )	( )	( )	( )
Paragraph Comprehension	( )	( )	( )	( )	( )
Sentence Meaning	( )	( )	( )	( )	( )
Location of Information	( )	( )	( )	( )	( )
Poetry Comprehension	( )	( )	( )	( )	( )

Indicate below, by test title and/or item numbers, any test or item which you thought was too difficult in any way or inappropriate for your students. In addition, was the test format appropriate for your students? Feel free to share any other comments about the test.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

9. Consider the three groups of students that have taken this test — 1944-45, 1976 and 1986. In your judgment, would students in any of the three years have an advantage over the other two groups in answering any of the questions? Which questions? Please explain.

_____
_____
_____
_____
_____
_____

10. Indiana University and the Indiana Department of Education are conducting related studies concerning the relative performances of 1944 and 1986 students on the *Iowa Test of Basic Skills*, and Indiana teachers may be needed to perform some of the analysis. If you volunteer to help, a small stipend will be paid for several hours of work. Because of the historical nature of the study, teacher age is important in considering perspective. If you may be interested in participating, please write your name, age and telephone number below. You are under no obligation.

Your name _____

Age _____

Telephone number _____